24 inch TFT WXGA LCD Colour Monitor

Chassis: HUDSON 9

Service
Service
Service

240BW9CS/00
240BW9CB/00
240BW9CB/27
240BW9CB/69
240BW9CB/75
240BW9CB/93

Service Manual

Horizontal frequencies
30 - 83 kHz

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SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOL TAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

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Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should becarefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the servicetrade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips. **

WARNING

Critical components having special safety characteristics are identified with a by the Ref. No. in the parts list and enclosed within a broken line
(where several critical components are grouped in one area) along with the safety symbol on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design.

Servicer assumes all liability.

FOR PRODUCTS CONTAINING LASER:

DANGER - Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION - The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may as hort circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

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Technical Data

SEC Panel

Type NR.	: SEC LTM240CT03
Resolution	: 1920x1200 (WUXGA)
Outside dimensions	: 546.4 (H) x 352 (V) x 36.3 (D)
Pitch (mm)	: 0.27
Color pixel arrangement	: RGB vertical stripes
Display surface	: Haze 25% , Hard-coating(3H)
Color depth	: 16.7 M colors
Backlight	: U-type 6 CCFTs
Active area(WxH)	: 518.4(H) x 324(V)
View angle (CR>10)	: 160/160 (typ) for H/V
Contrast ratio	: 1000:1 (typ)
White luminance	: 400 (typ)
Color gamut	: 92%
Gate IC	: LDI
Source IC	: LDI
Response time	: 5 ms(typ)

Scanning frequencies

Hor. : 24 – 94 K Hz
Ver.: 48 - 85 Hz
Video dot rate: 210MHz for VGA and 170 for DVI
Power input: 90-264 V AC, 50/60 ± 2 Hz
Power consumption: < 85 W / after 30 mins, meet EPA tier 2 requirement

Functions:

(1)D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync

(2) DVI digital Panel Link TMDS inputs

Ambient temperature: 0 °C - 40°C

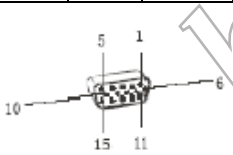
Power input connection

Power cord length : 1.8 M
Power cord type : 3 leads power cord with protective earth plug.

Power management

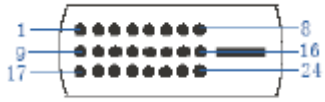
The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	85W typical (After 30 mins)	Blue LED	--
Off	Off	Off	blanked	< 1 W (<110V & no audio) < 2 W (<220V & no audio)	Blue LED Blinking 3 sec on, 3sec off	< 3 s
DC Power Off			N/A	< 1 W	LED Off	



PIN No.	SIGNAL	PIN No.	SIGNAL
1	Red	9	DDC +3.3V or +5V
2	Green/ SOG	10	Logic GND
3	Blue	11	Sense (GND)
4	Sense (GND)	12	Bi-directional data
5	Cable Detect (GND)	13	H/H+V sync
6	Red GND	14	V-sync
7	Green GND	15	Data clock
8	Blue GND		

Input DVI-D connector pin



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V) – Cable detect
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Susceptibility of display to external environment

Operating
- Temperature : 0 to 40 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage
- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

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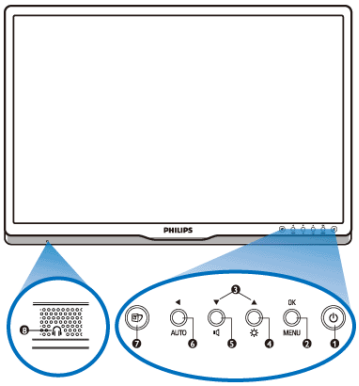
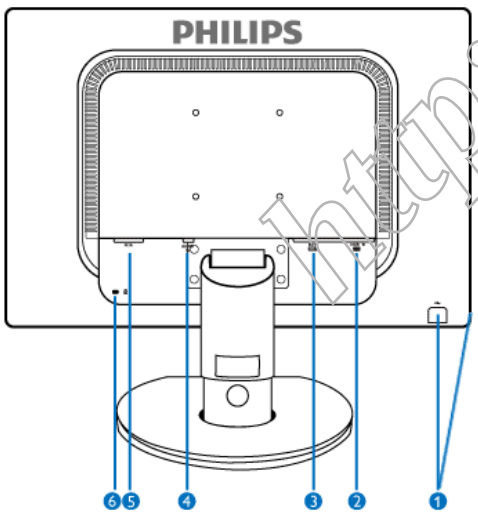
Installation

Front View Product Description



1		To switch monitor's power On and Off
2	MENU / OK	To access OSD menu
3	▲▼	To adjust the OSD menu
4		To adjust brightness of the display
5		To adjust volume of the display
6	AUTO / ◀	Automatically adjust the horizontal position, vertical position, phase and clock settings / Return to previous OSD level
7		SmartImage. There are five modes to be selected: Office Work, Image Viewing, Entertainment, Economy, and Off
8		Earphone jack

Rear View



1 USB upstream port and downstream port
2 VGA input
3 DVI-D input (available for selective models)
4 PC Audio input
5 AC power input
6 Kensington anti-thief lock

Accessory Pack

Unpack all the parts.

Power cord

DVI cable (Optional)

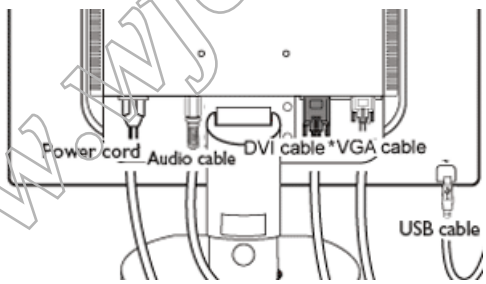
VGA cable

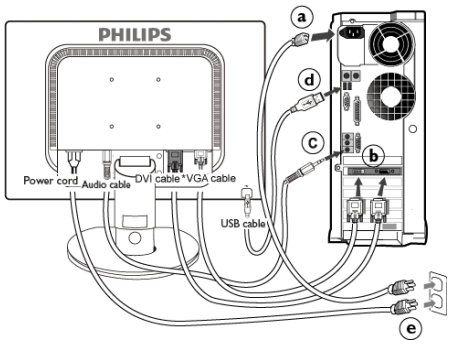
EDFU pack

Audio cable

Connecting to Your PC

1) Connect the power cord to the back of the monitor firmly. (Philips has pre-connected VGA cable for the first installation.





2) Connect to PC

(a) Turn off your computer and unplug its power cable.

(b) Connect the monitor signal cable to the video connector on the back of your computer.

(c) Connect the PC audio cable to the audio connector on the back of your computer.

(d) Connect the USB upstream port on the monitor and the USB port on PC with a USB cable. The USB downstream port is now ready for any USB device to plug in.

(e) Plug the power cord of your computer and your monitor into a nearby outlet.

(f) Turn on your computer and monitor. If the monitor displays an image, installation is complete.

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Trouble shooting

This page deals with problems that can be corrected by a user. If the problem still persists after you have tried thesesolutions, contact Philips customer service representative.

Common Problems	
Having this problem	Check these items
No Picture (Power LED not lit)	1.Make sure the power cord is plugged into the power outlet and into the back of the monitor. 2.First, ensure that the power button on the front of the monitor is in the OFF position, then press it to the ON position.
No Picture (Power LED is amber or yellow)	1.Make sure the computer is turned on. 2. Make sure the signal cable is properly connected to your computer. 3.Check to see if the monitor cable has bent pins. 4.The Energy Saving feature may be activated
Screen says	1. Make sure the monitor cable is properly connected to your computer. (Also refer to the Quick Set-Up Guide). 2.Check to see if the monitor cable has bent pins. 3. Make sure the computer is turned on.
AUT O button not working properly	1.The Auto Function is designed for use on standard Macintosh or IBM-compatible PCs running Microsoft Windows. 2. It may not work properly if using nonstandard PC or video card.
Imaging Problems	
Display position is incorrect	1.Press the Auto button. 2. Adjust the image position using the Horizontal Position and/or Vertical Position in OSD Main Controls.
Image vibrates on the screen	Check that the signal cable is properly connected to the graphics board or PC.
Vertical flicker appears	1. Press the Auto button. 2. Eliminate the vertical bars using the More Settings of Phase/Clock in OSD Main Controls.
Horizontal flicker appears	1. Press the Auto button. 2. Eliminate the vertical bars using the More Settings of Phase/Clock in OSD Main Controls.
The screen is too bright or too dark	Adjust the contrast and brightness on OSD Main Controls. (The backlight of the LCD monitor has a fixed life span. When the screen becomes dark or begins to flicker, please contact your dealer).
An after-image appears	If an image remains on the screen for an extended period of time, it may be imprinted in the screen and leave an afterimage. This usually disappears after a few hours.
An after-image remains after the power has been turned off.	This is characteristic of liquid crystal and is not caused by a malfunction or deterioration of the liquid crystal. The after-image will disappear after a peroid of time.
Green, red, blue, dark, and white dots Remains	The remaining dots are normal characteristic of the liquid crystal used in today's technology.

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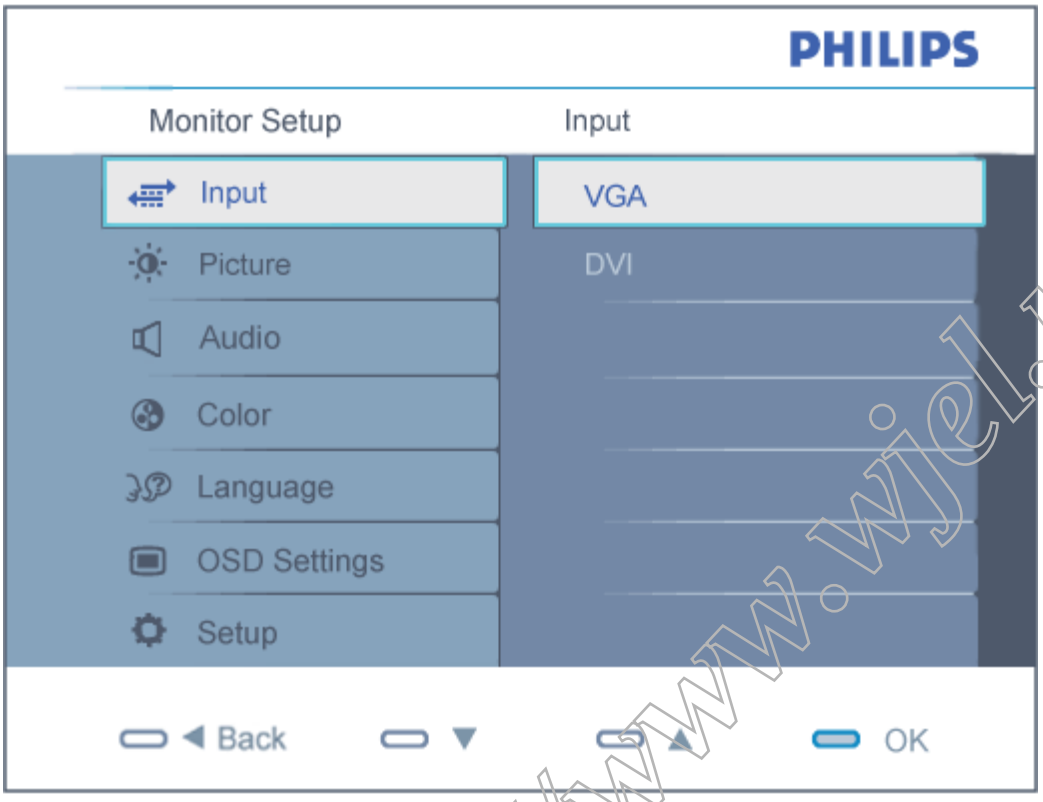
On Screen Display

Description of the On Screen Display

What is the On-Screen Display?

On-Screen Display (OSD) is a feature in all Philips LCD monitors. It allows an end user to adjust screen performance or select functions of the monitors directly through an on-screen instruction window. A user friendly on screen display interface is shown as below :



Basic and simple instruction on the control keys.

In the OSD shown above users can press buttons at the front bezel of the monitor to move the cursor, OK to confirm the choice or change.

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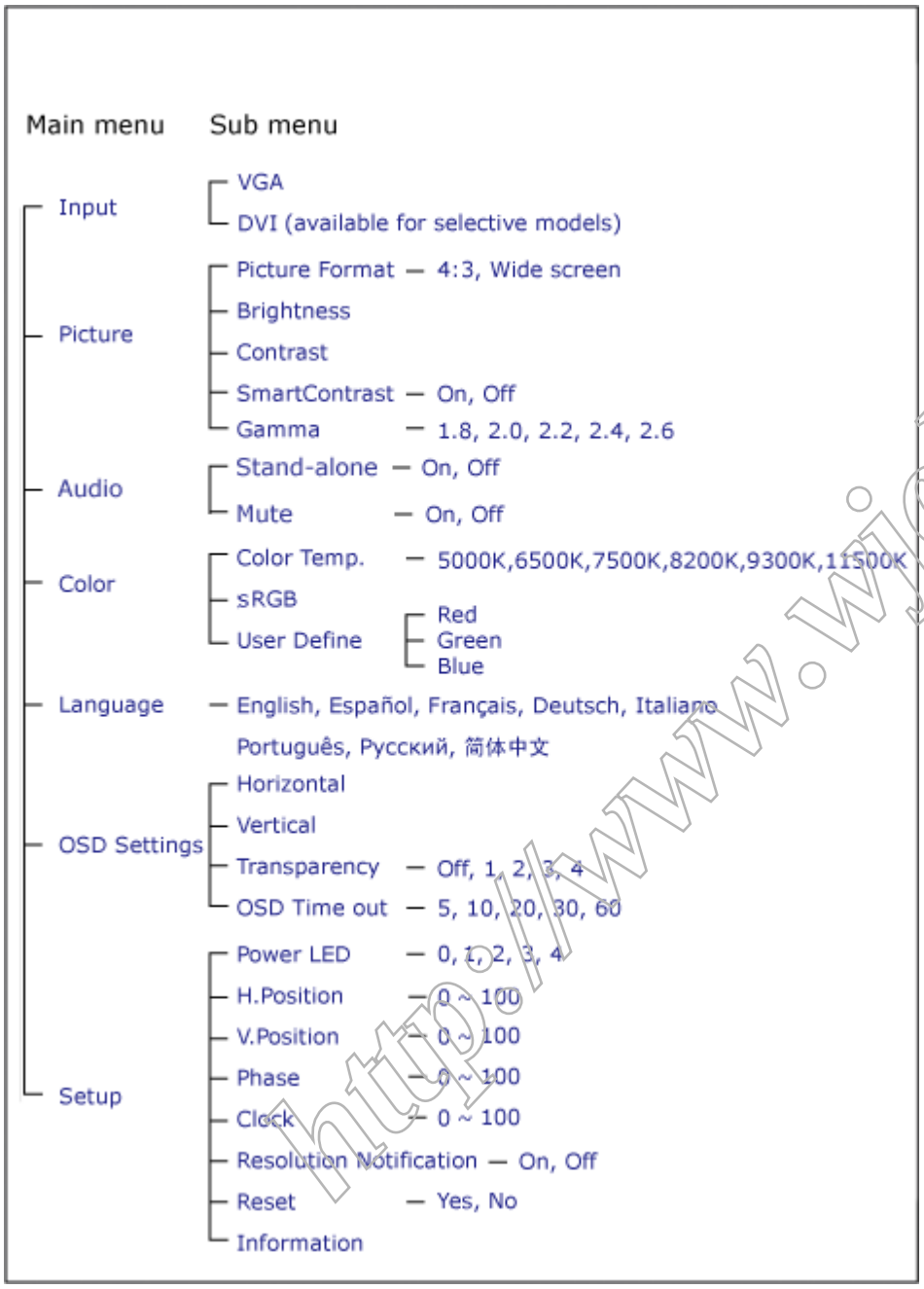
On Screen Display

The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



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Resolution notification

This monitor is designed for optimal performance at its native resolution, 1920x1200@60Hz. When the monitor is powered on at a different resolution, an alert is displayed on screen: Use 1920x1200@60Hz for best results.

Display of the native resolution alert can be switched off from Setup in the OSD (On Screen Display) menu.

Lock/Unlock,Aging,Factory Mode

To Lock/Unlock OSD FUNCTION(User Mode)

The OSD function can be locked by pressing"OK"button(1) for more than 10 seconds, the screen shows following windows for 4 seconds. Every time when you press"OK" button, this message appears on the screen automatically.

Unlock OSD function

Unlocked OSD function can be released by pressing "OK" button for more than 10 seconds again.

Access Factory Mode

1). Turn off monitor.
2). [Push "AUTO" & "MENU" buttons at the same time and hold them] +[Press "power" button until comes out "Windows screen"] => then release all buttons
3).Press "MENU" button, wait until the OSD menu with Characters "HUDSON 240SW9 V0.07 2007-12-21 " (below OSD menu) come on the Screen of the monitor.

Factory Mode indicator

Factory Menu

Cursor can move on gray color area
Hot key function: by pressing " UP " and " DOWN " key Simultaneously at User Mode (or Factory Mode)
(PS: The Offset R G B function can be used on reduce or eliminate snowy noise on the background when the resolution of video signal is 1680*1050vertical 60Hz. Slightly increase or decrease the value until snowy noise completely disappear .

Access Aging Mode

Step 1 : Access Factory Mode then enter Factory Menu.
Step 2 : By pressing " UP " and " DOWN" key to Burning Icon. Press "MENU " then press " UP " and " DOWN " key to turn on Aging Mode.

Step 3 : Disconnect interface cable between Monitor and PC.

After 3 seconds, bring up:

repeatly
Connect Signal cable again=> go back to normal display

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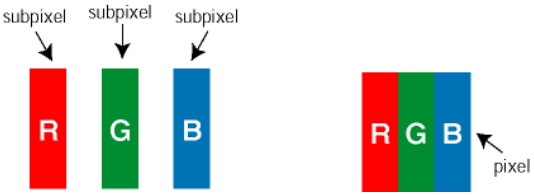
Philips Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

Philips strives to deliver the highest quality products. We use some of the industry's most advanced manufacturing processes and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that all panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 19" XGA monitor may be defective. Furthermore, Philips sets even higher quality standards for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



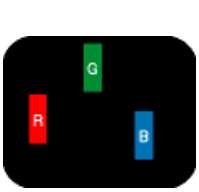
Pixels and Sub pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of a pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a single black pixel. Other combinations of lit and dark sub pixels appear as single pixels of other colors.

Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub-pixel defects within each category.

Bright Dot Defects Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a *bright dot* is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are the types of bright dot defects:



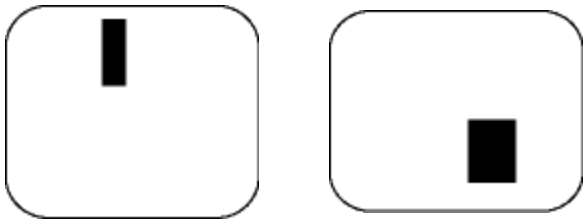
One lit red, green or blue sub pixel

Two adjacent lit sub pixels:
- Red + Blue = Purple
- Red + Green = Yellow
- Green + Blue = Cyan (Light Blue)

Three adjacent lit sub pixels (one white pixel)

A red or blue *bright dot* must be more than 50 percent brighter than neighboring dots while a green bright dot is 30 percent brighter than neighboring dots.

Black Dot Defects Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a *dark dot* is a sub-pixel that stands out on the screen when the monitor displays a light pattern. These are the types of black dot defects:



One dark sub pixel

Two or three adjacent dark sub pixels

Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**240BW9**
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects*	>15mm
Total bright dot defects of all types	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**240BW9**
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	0
Distance between two black dot defects*	>15mm
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	**240BW9**
Total bright or black dot defects of all types	5

Note:

* 1 or 2 adjacent sub pixel defects = 1 dot defect

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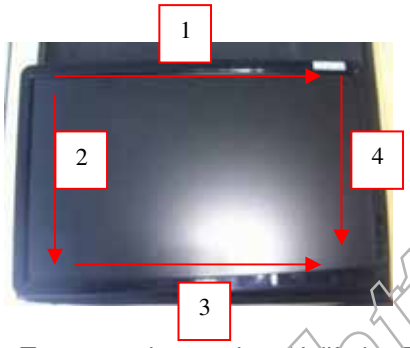
Mechanical Instruction

Disassemble the base, press the circular button
Bring the hinge

Tear off the Mylar on the screw, then use a small screw-driver disassemble the four screws

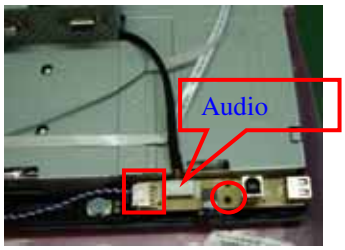
Disassembly the bezel from the monitor, notice the disassembly order :
1.Top (1) parts of bezel
2.Left (2) parts of bezel
3.Bottom (3) parts of bezel
4. Right (4) parts of bezel
Don't draw the BZL



Turn over the monitor, Uplift the Rear cover from the monitor

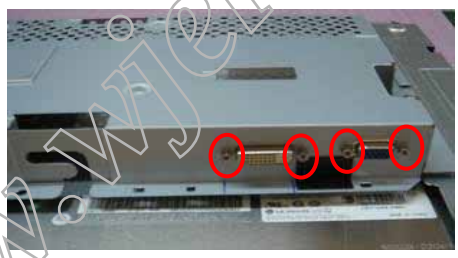
Take off all aluminum foils, then draw two pieces of FFC cables

Disassemble a screw on the audio board, tear off the cable, then draw the cable which links the speaker



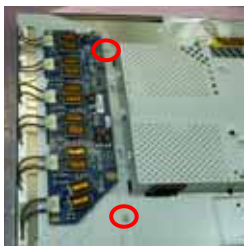
Take the entire internal mechanism from Bezel and put it on the cushion

Disassemble the Main-BKT: hexagonal screw *4



Draw out the cable, tear off a piece of adhesive tape and disassemble the iron slice which protect the inverter board

Disassemble the main mechanism screw *2



Pull out the lamp cables and disassemble the inverter board screw *4

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Mechanical Instruction

Tear off amber tape, then uplift the Main-BKT and unlock the LVDS by using two hands (see note).

Disassembled the Main-BKT: Side screw*2

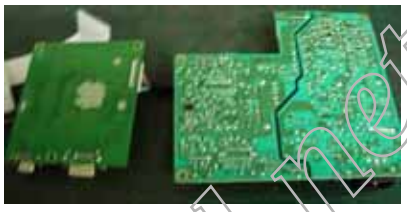
Disassembled the Main-BKT: Side screw*2

Remove the rubber on the power board and tear off a piece of adhesive tape which fixed the audio cable

Disassemble the Power board
→ 5 screws Tear off the AC-SOCKET cover

Disassemble the interface board→3 screws

Take the PCBA from Main-BKT and then put it on the cushion



Pull out two cables of Power board

Pull out the LVDS cable

Disassemble the C/B: screw*3
Uplift the LED/B, and separate the boards and bezel

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Color Adjustment

Alignment procedure
1. Turn on the LCD monitor .
2.Turn on the Timing/pattern generator. See Fig.1
3. Preset LCD color Analyzer CA-1 10
-Remove the lens protective cover of probe CA-A30.
-Set measuring/viewing selector to measuring position for reset analyzer .(zero calibration) as Fig.2
- Turn on the color analyzer (CA-1 10)
-Press 0-CAL button to starting reset analyzer .

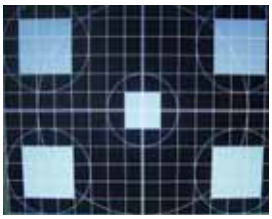

Fig. 1

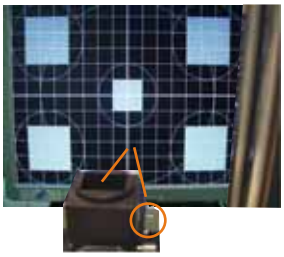

Fig. 2

4. Access Factory Mode

1). Turn off monitor.
2). [Push "AUT O" & "MENU" buttons at the same time and hold them]
+[Press "power" button untill comes out "Windows screen"]
=> then release all buttons
3).Press "MENU " button, wait until the OSD menu with Characters" HUDSON 240BW8 V0.13 2007-08-10 " (below OSD menu) come on the Screen of the monitor. as shown in Fig3.

Factory Mode indicator

Fig. 3

4). Press "MENU" button, then select factory mode indicator by "LEFT" or "RIGHT" button .Press"MENU" button to bring up submenu windows as below:

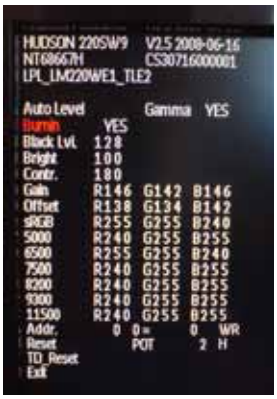

Fig. 4

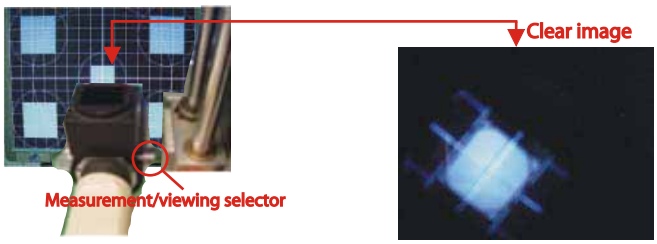

Fig.5

5.Display
Press "UP" or "DOWN" button to select . Change the value by "UP" or "DOWN" key until the X, Y co-ordinates as below

5.1 White color adjustment

There are three factory preset white color 9300K , 6500K , sRGB.
Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.
The 1931 CIE Chromaticity (color triangle) diagram (x ,y) coordinate for the screen center should be:

Production		Product SPEC	
5000K	x = 0.345 ± 0.006	5000K	x = 0.345 ± 0.02
	y = 0.357 ± 0.006		y = 0.357 ± 0.02
6500K	x = 0.313 ± 0.006	6500K	x = 0.313 ± 0.02
	y = 0.329 ± 0.006		y = 0.329 ± 0.02
7500K	x = 0.298 ± 0.006	7500K	x = 0.298 ± 0.02
	y = 0.314 ± 0.006		y = 0.314 ± 0.02
8200K	x = 0.291 ± 0.006	8200K	x = 0.291 ± 0.02
	y = 0.306 ± 0.006		y = 0.306 ± 0.02
9300K	x = 0.283 ± 0.006	9300K	x = 0.283 ± 0.02
	y = 0.297 ± 0.006		y = 0.297 ± 0.02
11500K	x = 0.270 ± 0.006	11500K	x = 0.270 ± 0.02
	y = 0.281 ± 0.006		y = 0.281 ± 0.02

Quality inspect

5000K	x = 0.345 ± 0.015
	y = 0.357 ± 0.015
6500K	x = 0.313 ± 0.015
	y = 0.329 ± 0.015
7500K	x = 0.298 ± 0.015
	y = 0.314 ± 0.015
8200K	x = 0.291 ± 0.015
	y = 0.306 ± 0.015
9300K	x = 0.283 ± 0.015
	y = 0.297 ± 0.015
11500K	x = 0.270 ± 0.015
	y = 0.281 ± 0.015

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FAQs (Frequently Asked Questions)

General FAQs

Q: When I install my monitor what should I do if the screen shows 'Cannot display this video mode'?

A: Recommended video mode for Philips 24": 1920x1200 @60Hz.
1.Unplug all cables, then connect your PC to the monitor that you used previously.
2.In the Windows Start Menu, select Settings/Control Panel. In the Control Panel Window, select the Display icon. Inside the Display Control Panel, select the 'Settings' tab. Under the setting tab, in box labeled 'desktop area', move the slidebar to 1920x1200 pixels (24").
3.Open 'Advanced Properties' and set the Refresh Rate to 60Hz, then click OK.
4.Restart your computer and repeat step 2 and 3 to verify that your PC is set at 1920x1200@60Hz (24").
5.Shut down your computer, disconnect your old monitor and reconnect your Philips LCD monitor.
6.Turn on your monitor and then turn on your PC.

Q: What are the .inf and .icm files on the CD-ROM? How do I install the drivers (.inf and .icm)?

A: These are the driver files for your monitor. Follow the instructions in your user manual to install the drivers. Your computer may ask you for monitor drivers (.inf and .icm files) or a driver disk when you first install your monitor. Follow the instructions to insert the (companion CD-ROM) included in this package. Monitor drivers (.inf and .icm files) will be installed automatically.

Q: How do I adjust the resolution?

A: Your video card/graphic driver and monitor together determine the available resolutions. You can select the desired resolution under Windows® Control Panel with the "Display properties".

Q: What if I get lost when I am making monitor adjustments?

A: Simply press the MENU button, the Setup button, then select 'Reset' to recall all of the original factory settings.

Q: What is the Auto function?

A: The *AUTO adjustment* key restores the optimal screen position, phase and clock settings by pressing of a single button – without the need to navigate through OSD (On Screen Display) menus and control keys.

Note: Auto function is available in selected models only.

Q: My Monitor has no power (Power LED does not light up). What should I do?

A: Make sure the AC power cord is connected between the monitor and AC outlet, and click a key on keyboard/mouse to wake up the PC.

Q: Will the LCD monitor accept an interlaced signal under PC models?

A: No. If an Interlace signal is used, the screen displays both odd and even horizontal scanning lines at the same time, thus distorting the picture.

Q: What does the Refresh Rate mean for LCD?

A: Unlike CRT display technology, in which the speed of the electron beam is swept from the top to the bottom of the screen determines flicker, an active matrix display uses an active element (TFT) to control each individual pixel and the refresh rate is therefore not really applicable to LCD technology.

Q: Will the LCD screen be resistant to scratches?
A: A protective coating is applied to the surface of the LCD, which is durable to a certain extent (approximately up to the hardness of a 2H pencil). In general, it is recommended that the panel surface is not subject to any excessive shocks or scratches.

Q: How should I clean the LCD surface?
A: For normal cleaning, use a clean, soft cloth. For extensive cleaning, please use isopropyl alcohol. Do not use other solvents such as ethyl alcohol, ethanol, acetone, hexane, etc.

Q:Can I change the color setting of my monitor?

A:Yes, you can change your color setting through OSD control as the following procedures,
1. Press "MENU" to show the OSD (On Screen Display) menu
2. Press "Down Arrow" to select the option "Color" then press "OK" to enter color setting, there are three settings as below.
a. Color Temperature; The six settings are 5000K, 6500K, 7500K, 8200K, 9300K and 11500K. With settings in the 5000K range the panel appears 'warm,' with a red-white color tone, while a 11500K temperature yields 'cool, blue-white toning."
b. sRGB; this is a standard setting for ensuring correct exchange of colors between different device (e.g. digital cameras, monitors, printers, scanners, etc)
c. User Define; the user can choose his/her preference color setting by adjusting red, green blue color.
d. Gamma; The five settings are 1.8, 2.0, 2.2, 2.4, and 2.6.

*A measurement of the color of light radiated by an object while it is being heated. This measurement is expressed in terms of absolute scale, (degrees Kelvin). Lower Kevin temperatures such as 2004K are red; higher temperatures such as 9300K are blue. Neutral temperature is white, at 6504K.

Q: Can the Philips LCD Monitor be mounted on the wall?

A: Yes. Philips LCD monitors have this optional feature. For standard VESA mount holes on the rear cover allows the user to mount the Philips monitor on most of the VESA-standard arms or accessories. We recommend to contact your Philips sales representative for more information.

Screen Adjustments

Q: When I install my monitor, how do I get the best performance from the monitor?

A:For best performance, make sure your display settings are set at 1920x1200@60Hz for 24".

Q: How do LCDs compare to CRTs in terms of radiation?

A: Because LCDs do not use an electron gun, they do not generate the same amount of radiation at the screen surface.

Compatibility with other Peripherals

Q: Can I connect my LCD monitor to any PC, workstation or Mac?

A: Yes. All Philips LCD monitors are fully compatible with standard PCs, Macs and workstations. You may need a cable adapter to connect the monitor to your Mac system. Please contact your Philips sales representative for more information.

Q: Are Philips LCD monitors Plug-and-Play?

A: Yes, the monitors are Plug-and-Play compatible with Windows® 95, 98, 2000, XP and Vista.

Q: What is USB (Universal Serial Bus)?

A: Think of USB as a smart plug for PC peripherals. USB automatically determines resources (like driver software and bus bandwidth) required by peripherals. USB makes necessary resources available without user intervention. There are three main benefits of USB. USB eliminates "case anxiety," the fear of removing the computer case to install circuit board cards -- that often requires adjustment of complicated IRQ settings -- for add-on peripherals. USB does away with "port gridlock." Without USB, PCs are normally limited to one printer, two Com port devices (usually a mouse and modem), one Enhanced Parallel Port add-on (scanner or video camera, for example), and a joystick. More and more peripherals for multimedia computers come on the market every day. With USB, up to 127 devices can run simultaneously on one computer. USB permits "hot plug-in." No need to shut down, plug in, reboot and run set up to install peripherals. No need to go through the reverse process to unplug a device. Bottom line: USB transforms today's "Plug-and-Pray" into true Plug-and-Play!
Please refer to glossary for more information about USB.

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FAQs (Frequently Asked Questions)

Q: What is a USB hub ?

A: A USB hub provides additional connections to the Universal Serial Bus. A hub's upstream port connects a hub to the host, usually a PC. Multiple downstream ports in a hub allows connection to another hub or device, such as a USB keyboard, camera or printer.

LCD Panel Technology

Q: What is a Liquid Crystal Display?

A: A Liquid Crystal Display (LCD) is an optical device that is commonly used to display ASCII characters and images on digital items such as watches, calculators, portable game consoles, etc. LCD is the technology used for displays in notebooks and other small computers. Like light-emitting diode and gas-plasma technologies, LCD allows displays to be much thinner than cathode ray tube (CRT) technology. LCD consumes much less power than LED and gas-displays because it works on the principle of blocking light rather than emitting it.

Q: What differentiates passive matrix LCDs from active matrix LCDs?

A: An LCD is made with either a passive matrix or an active matrix display grid. An active matrix has a transistor located at each pixel intersection, requiring less current to control the luminance of a pixel. For this reason, the current in an active matrix display can be switched on and off more frequently, improving the screen refresh time (your mouse pointer will appear to move more smoothly across the screen, for example). The passive matrix LCD has a grid of conductors with pixels located at each intersection in the grid.

Q: What are the advantages of TFT LCD compared with CRT?

A: In a CRT monitor, a gun shoots electrons and general light by colliding polarized electrons on fluorescent glass. Therefore, CRT monitors basically operate with an analog RGB signal. A TFT LCD monitor is a device that displays an input image by operating a liquid crystal panel. The TFT has a fundamentally different structure than a CRT: Each cell has an active matrix structure and independent active elements. A TFT LCD has two glass panels and the space between them is filled with liquid crystal. When each cell is connected with electrodes and impressed with voltage, the molecular structure of the liquid crystal is altered and controls the amount of inlet lighting to display images. A TFT LCD has several advantages over a CRT, since it can be very thin and no flickering occurs because it does not use the scanning method.

Q: Why is vertical frequency of 60Hz optimal for an LCD monitor?

A: Unlike a CRT monitor, the TFT LCD panel has a fixed resolution. For example, an XGA monitor has 1024x3 (R, G, B) x 768 pixels and a higher resolution may not be available without additional software processing. The panel is designed to optimize the display for a 65MHz dot clock, one of the standards for XGA displays. Since the vertical/horizontal frequency for this dot clock is 60Hz/48kHz, the optimum frequency for this monitor is 60Hz.

Q: What kind of wide-angle technology is available? How does it work?

A: The TFT LCD panel is an element that controls/displays the inlet of a backlight using the dual-refraction of a liquid crystal. Using the property that the projection of inlet light refracts toward the major axis of the liquid element, it controls the direction of inlet light and displays it. Since the refraction ratio of inlet light on liquid crystal varies with the inlet angle of the light, the viewing angle of a TFT is much narrower than that of a CRT. Usually, the viewing angle refers to the point where the contrast ration is 10. Many ways to widen the viewing angle are currently being developed and the most common approach is to use a wide viewing angle film, which widens the viewing angle by varying the refraction ratio. IPS (In Plane Switching) or MVA (Multi Vertical Aligned) is also used to give a wider viewing angle.

Q: Why is there no flicker on an LCD Monitor?

A: Technically speaking, LCDs do flicker, but the cause of the phenomenon is different from that of a CRT monitor -- and it has no impact of the ease of viewing. Flickering in an LCD monitor relates to usually undetectable luminance caused by the difference between positive and negative voltage. On the other hand, CRT flickering that can irritate the human eye occurs when the on/off action of the fluorescent object becomes visible. Since the reaction speed of liquid crystal in an LCD panel is much slower, this troublesome form of flickering is not present in an LCD display.

Q: Why is an LCD monitor virtually low of Electro Magnetic Interference?

A: Unlike a CRT, an LCD monitor does not have key parts that generate Electro Magnetic Interference, especially magnetic fields. Also, since an LCD display utilizes relatively low power, its power supply is extremely quiet.

Ergonomics, Ecology and Safety Standards

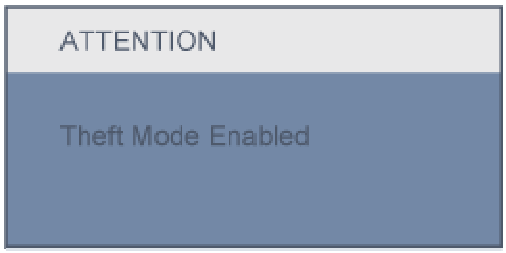
Q: What is the CE mark?

A: The CE (Conformité Européenne) mark is required to be displayed on all regulated products offered for sale on the European market. This 'CE' mark means that a product complies with the relevant European Directive. A European Directive is a European 'Law' that relates to health, safety, environment and consumer protection, much the same as the U.S. National Electrical Code and UL Standards.

Q: Does the LCD monitor conform to general safety standards?

A: Yes. Philips LCD monitors conform to the guidelines of MPR-II and TCO 99/03 standards for the control of radiation, electromagnetic waves, energy reduction, electrical safety in the work environment and recyclability. The specification page provides detailed data on safety standards.

Q: After i change new PC, I found this information on screen, how can I do?



A: Because you activate Theft Deterrence function in SmartControl II. Please contact IT manager or Philips Service Center.

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Electrical Instructions

1. Electrical characteristics
1.1 Interface signals
1). D-Sub Analog

Input signal : Video, Hsync., Vsync

Video : 0.7 Vp-p, input impedance, 75 ohm @DC

Sync. : Separate sync TTL level , input impedance 2.2k ohm terminate

Hsync Positive/Negative

Vsync Positive/Negative

Composite sync TTL level, input impedance 2.2k ohm terminate (Positive/Negative)

Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

2). DVI-D Digital

Input signal: Single TMDS link (Three channels: RX0-/+, RX1-/+, RX2-/+)

3). Audio

Input signal: 800 mVrms

Loudspeaker (Impedance: 5.3 Ohm +/-15%): 1.5W+ 1.5W stereo for RMS Power

Frequency range: 650Hz - 20KHz

Headphone connection will mute speakers

4). USB PLUG 2.0 (Not required in 240BW8)

Input signal: Upstream input (V_{BUS}, D+, D-, GND) via USB-B receptacle.

Output signal: Downstream output (V_{BUS}, D+, D-, GND) through USB-A receptacle

1.2 Interface
1.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm

Connector type : D-Sub male with DDC2B pin assignments.
Blue connector thumb-operated jack screws

1.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.

Length. : 1.8 M +/- 50 mm

Connector type. : DVI-D male with DDC-2B pin assignments
White connector thumb-operated jackscrews

1.2.3.Audio Cable

Length : 1.8 M +/- 50 mm

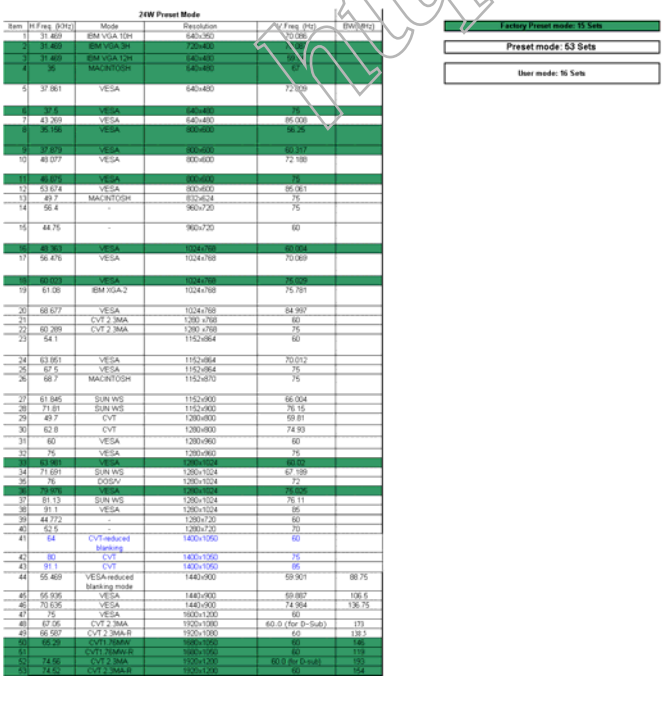
Connector type : 3.5-mini jack with Lemon green color on the both end heads.
Sliver & Black model: Black cable.
T color model: white cable.

1.3 Timing requirement
1.3.1Mode storing capacity

Factory preset modes : 15
Preset modes : 53
User define modes : 16 (waiting for supplier input)

Note: 1.Screen displays perfect picture at 15 factory-preset modes.
2.Screen displays visible picture with OSD warning when input modes are the 51 preset modes

Factory preset modes (15 modes)



24W Preset Mode

Item	H Freq. (KHz)	Mode	Resolution	V Freq. (Hz)	BW (MHz)
1	31.469	IBM VGA 10H	640x350	70.086	
2	31.469	IBM VGA 3H	720x400	70	
3	31.469	IBM VGA 12H	640x480	60	
4	35	MACINTOSH	640x480	67	
5	37.861	VESA	640x480	72.809	
6	37.5	VESA	640x480	75	
7	43.269	VESA	640x480	85.008	
8	35.156	VESA	800x600	56.25	
9	37.879	VESA	800x600	60.317	
10	48.077	VESA	800x600	72.188	
11	46.875	VESA	800x600	75	
12	53.674	VESA	800x600	85.061	
13	49.7	MACINTOSH	832x624	75	
14	56.4	-	960x720	75	
15	44.75	-	960x720	60	
16	48.363	VESA	1024x768	60.004	
17	56.476	VESA	1024x768	70.069	
18	60.023	VESA	1024x768	75.029	
19	61.08	IBM XGA 2	1024x768	75.781	
20	68.677	VESA	1024x768	84.997	
21		CVT 2.3MA	1280 x768	60	
22	60.289	CVT 2.3MA	1280 x768	75	
23	54.1		1152x864	60	
24	63.851	VESA	1152x864	70.012	
25	67.5	VESA	1152x864	75	
26	68.7	MACINTOSH	1152x870	75	
27	61.845	SUN WS	1152x900	66.004	
28	71.81	SUN WS	1152x900	76.15	
29	49.7	CVT	1280x800	59.81	
30	62.8	CVT	1280x800	74.93	
31	60	VESA	1280x960	60	
32	75	VESA	1280x960	75	
33	63.981	VESA	1280x1024	60.02	
34	71.691	SUN WS	1280x1024	67.189	
35	76	DOS/V	1280x1024	72	
36	79.976	VESA	1280x1024	75.025	
37	81.13	SUN WS	1280x1024	76.11	
38	91.1	VESA	1280x1024	85	
39	44.772	-	1280x720	60	
40	52.5	-	1280x720	70	
41	64	CVT-reduced blanking	1400x1050	60	
42	80	CVT	1400x1050	75	
43	91.1	CVT	1400x1050	85	
44	55.469	VESA-reduced blanking mode	1440x900	59.901	88.75
45	55.935	VESA	1440x900	59.887	106.5
46	70.635	VESA	1440x900	74.984	136.75
47	75	VESA	1600x1200	60	
48	67.05	CVT 2.3MA	1920x1080	60.0 (for D-Sub)	173
49	66.587	CVT 2.3MA-R	1920x1080	60	138.5
50	66.29	CVT1.76MW	1680x1050	60	146
51		CVT1.76MW-R	1680x1050	60	119
52	74.56	CVT 2.3MA	1920x1200	60.0 (for D-Sub)	193
53	74.52	CVT 2.3MA-R	1920x1200	60	154

Factory Preset mode: 15 Sets

Preset mode: 53 Sets

User mode: 16 Sets

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2. White color adjustment

There are three factory preset white color 9300K, 6500K, sRGB. Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position. The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

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11500K	x = 0.270 ± 0.006	11500K	x = 0.270 ± 0.02
	y = 0.281 ± 0.006		y = 0.281 ± 0.02

Quality inspect

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9300K	x = 0.283 ± 0.015
	y = 0.297 ± 0.015
11500K	x = 0.270 ± 0.015
	y = 0.281 ± 0.015

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DDC Data Re-programming
In case the DDC data memory IC or main EEPROM which storage all factory settings were replaced due to a defect, the serial numbers have to be re-programmed "Analog DDC IC, Digital DDC IC & EEPROM".
It is advised to re-soldered DDC IC and main EEPROM from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information
Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA).
Extended Display Identification Data(EDID) information may be also obtained from VESA.

Configuration and procedure
"PI-EDID" The software is provided by IMS to upgrade the firmware of CPU.
PI-EDID Tools is for the interface between "Parallel Port of PC" and "15 pin-D-SUB connector of Monitor".
It is a windows-based program, which cannot be run in MS-DOS.
System and equipment requirements
1. An Pentium (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP and Port95NT.exe.
3. EDID Software "PI-EDID.exe"
4. ISP boardas shown in Fig. 1

And I2C Board Jump wire should follow J10 (short), J9 (open), J5/J6/ (1and 2 pin short) J7/J8 (1 and 2 pin short)

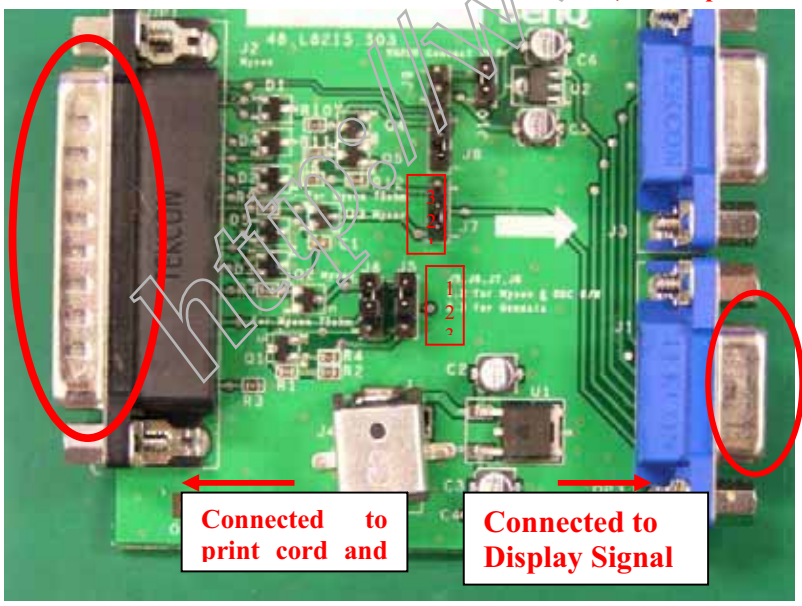

Fig.1

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5. Connect and Mains cord to Monitor as shown in Fig.2.

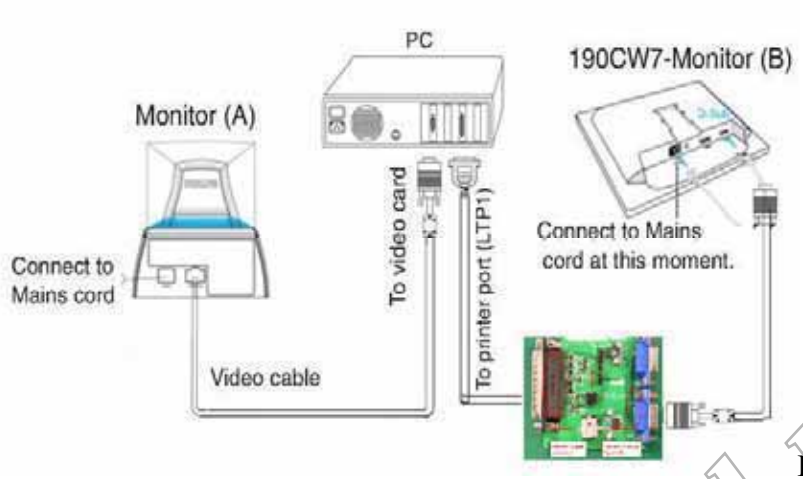
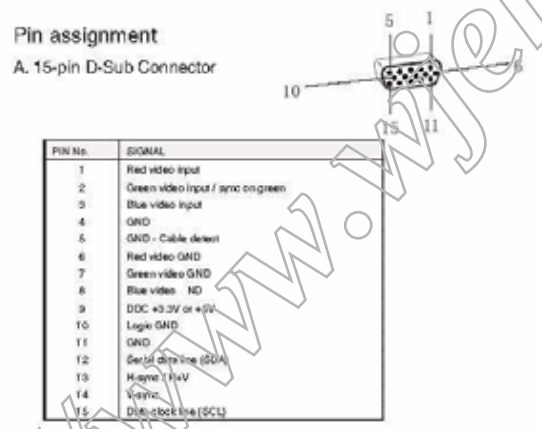
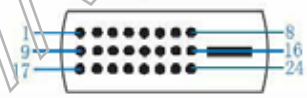


Fig.2



PIN No.	SIGNAL
1	Red video input
2	Green video input / sync on green
3	Blue video input
4	GND
5	GND - Cable detect
6	Red video GND
7	Green video GND
8	Blue video GND
9	DDC +3.3V or +5V
10	Logic GND
11	GND
12	Serial data line (SDA)
13	H-sync / H+V
14	V-sync
15	Data clock line (SCL)

B. Input DVI-D Connector pin



Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V) - Cable detect
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect
21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

Fig. 2a

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6. Setup the Philips-IMS EDID Tools program
Step 1: Make a folder in your PC as shown in Fig. 3.
For example: C:\EDID
Step 2: Copy PI-EDID Software into your folder as shown in Fig.3.

Fig.3

Step 3: Copy the
LCD_Analog.ddc and LCD_DVI.ddc
to C:\EDID as shown in Fig. 4 .

Fig.4

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Update the DDC
1. Connect DSUB Cable to I2C Board.
Double click the PI-EDID.exe icon in desktop then appears window as shown in Fig.5.

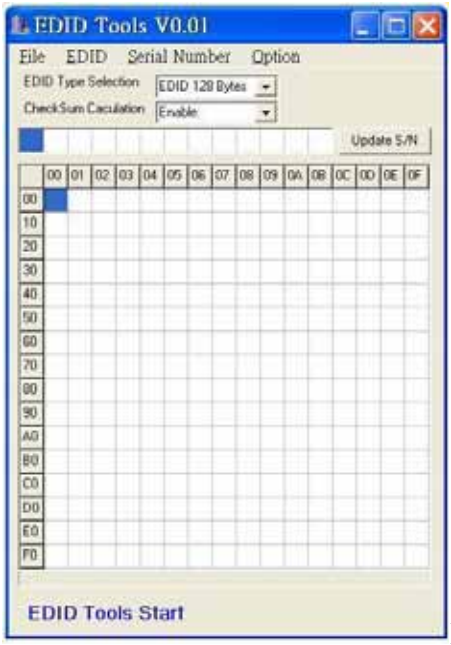

Fig.5

2. Press File->OPEN EDID to Load DDC file as shown in Fig.6.
Load Analog EDID file LCD_Analog.ddc to PI-EDID.exe

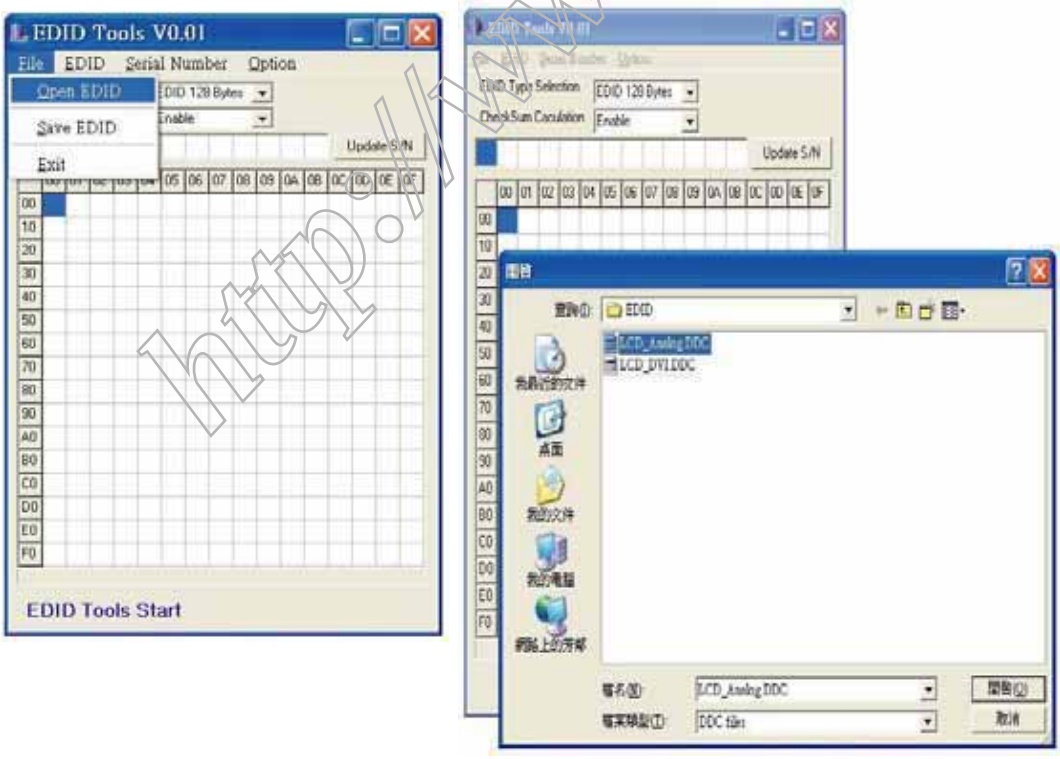

Fig.6

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3. Load EDID file OK as shown in Fig.7.

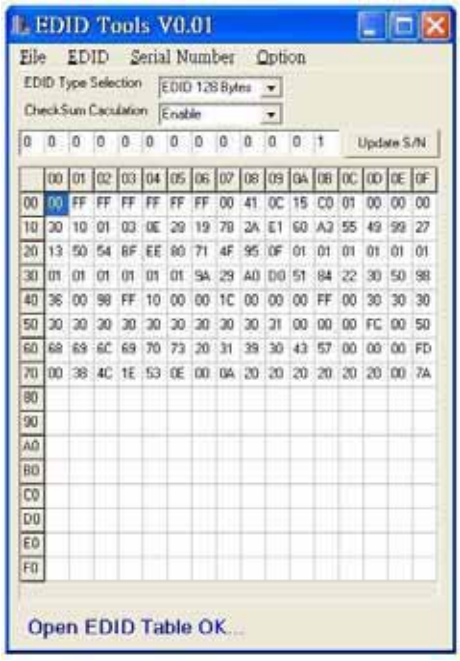

Fig.7

4. Modify Serial Number then Press "Update S/N" button as shown in Fig.8.

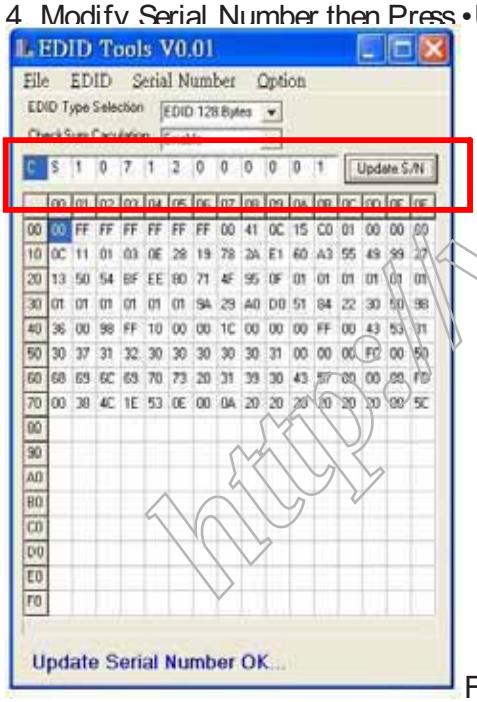

Fig.8

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5. Press EDID->Write to write EDID data to EEPROM as shown in Fig. 9.

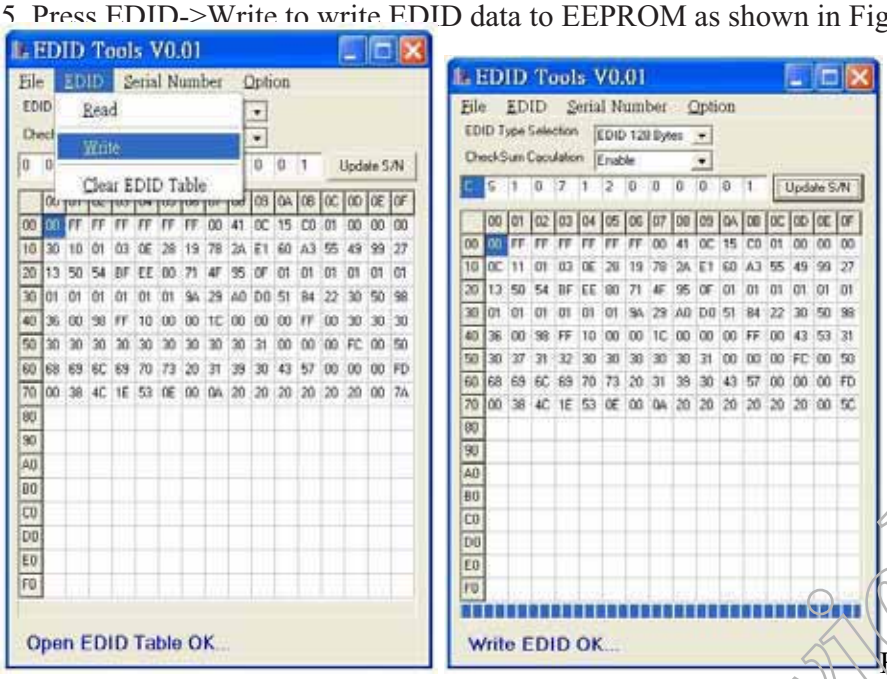

Fig.9

6. Connect DVI Cable to I2C Board.
   Repeat Step 1~5 to write DVI EDID file.

7. Enter Factory Mode then Press the Serial Number->Write EDIDS/N to EEPROM as shown in Fig.10
   Note: If not enter Factory Mode, this Wrote EDID S/N will not work.

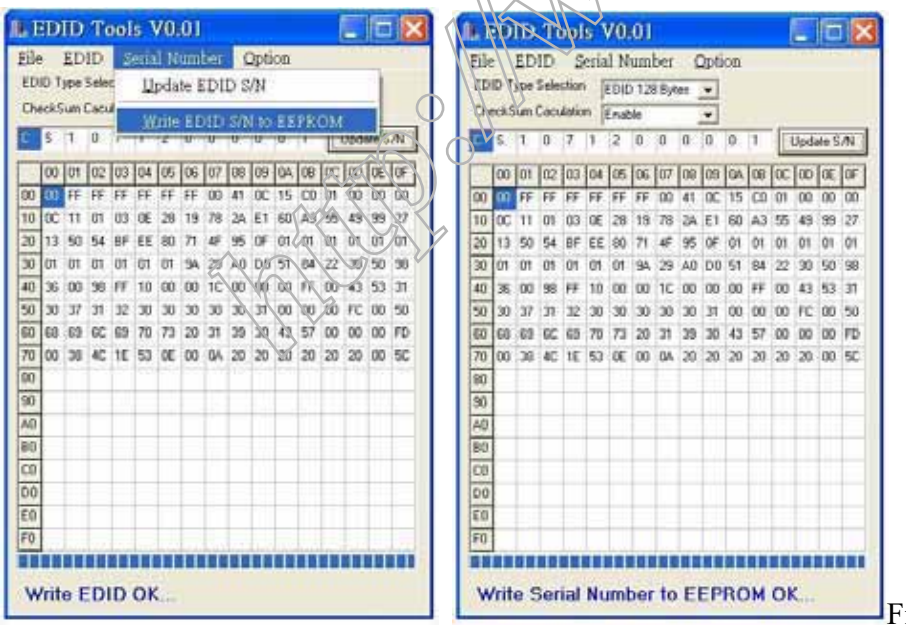

Fig.10

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DDC instruction

8. Press Monitor Menu Key to check OSD Serial number is the same as PI-EDID write data as shown in Fig.10
   Note: If not the same, please rewrite EDID S/N again.

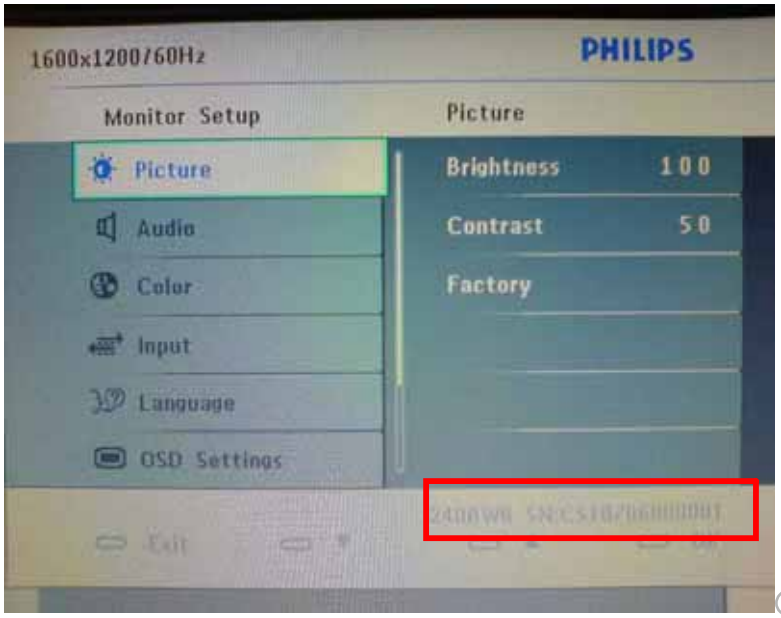

Fig.14

9 Turn off the monitor, exit the factory mode.

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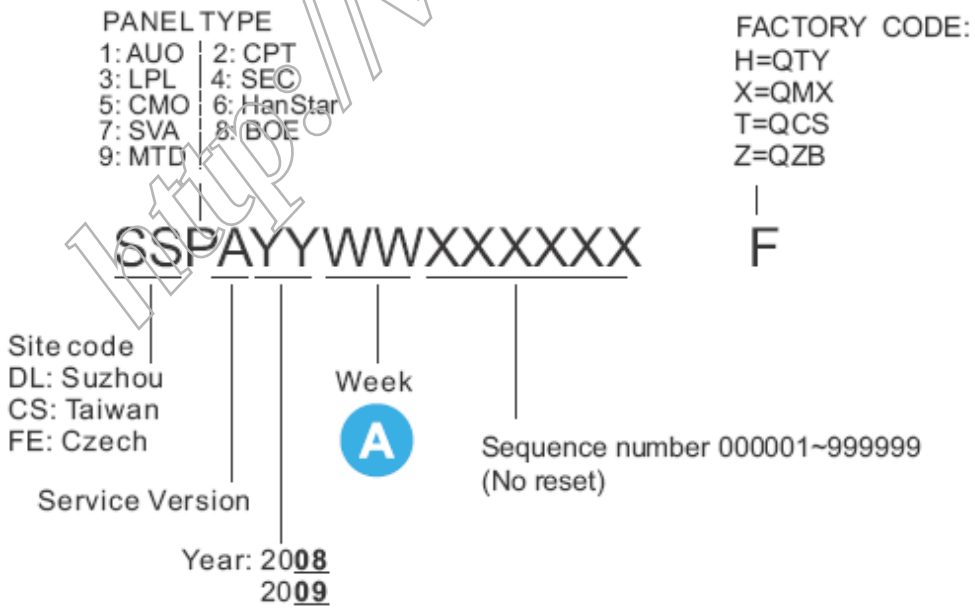
Serial Number Definition



DDC DATA

Analog:
****
EDID Log File
****

Vendor/Product Identification
- Manufacturer Name : PHL
- Product : 0872
- Serial Number :
- Week of Manufacture : 15
- Year of Manufacture : 2008

EDID Structure Version , Revision
- Version # : 01
- Revision # : 03

Basic Display Parameters/Features
- Vedio Input Definition : Bit 7 [0] Analog Singal Level
  - : Bit 6,5 [0,0] Operation 0.700,0.300 (1.000 V p-p)
  - : Bit 4 [0] Without Blank-to-black setup
  - : Bit 3 [1] Seperate syncs. Supported
  - : Bit 2 [1] Composite syncs. Supported
  - : Bit 1 [1] syncs. on green video Supported
  - : Bit 0 [0] Serration of the Vsync. Pulse Not Required
- Max. Horizontal Image Size (mm) : 520
- Max. Vertical Image Size (mm) : 320
- Display Transfer Characteristic : 2.2
- Featuer Support : Bit 7 [1] Standby Supported
  - : Bit 6 [1] Suspend Supported
  - : Bit 5 [1] Active off
  - : Bit 4,3 [0,1] RGB color display
  - : Bit 2 [1] Primary Color Space: sRGB Standard
  - : Bit 1 [*] Reserved
  - : Bit 0 [0] Default GTF Not Supported

Color Characteristic
- Red - x : 0.6572265625
- Red - y : 0.328125
- Green - x : 0.212890625
- Green - y : 0.6728515625
- Blue - x : 0.142578125
- Blue - y : 0.0712890625
- White - x : 0.3134765625
- White - y : 0.3291015625

Established Timing
- Established Timinigs I : Bit 7 [1] 720 x 400 @ 70 Hz Supported (IBM,VGA)
  - : Bit 6 [0]
  - : Bit 5 [1] 640 x 480 @ 60 Hz Supported (IBM,VGA)
  - : Bit 4 [1] 640 x 480 @ 67 Hz Supported (Apple,MacII)
  - : Bit 3 [1] 640 x 480 @ 72 Hz Supported (VESA)
  - : Bit 2 [1] 640 x 480 @ 75 Hz Supported (VESA)
  - : Bit 1 [1] 800 x 600 @ 56 Hz Supported (VESA)
  - : Bit 0 [1] 800 x 600 @ 60 Hz Supported (VESA)
- Established Timinigs II : Bit 7 [1] 800 x 600 @ 72 Hz Supported (VESA)
  - : Bit 6 [1] 800 x 600 @ 75 Hz Supported (VESA)
  - : Bit 5 [1] 832 x 624 @ 75 Hz Supported (Apple,MacII)
  - : Bit 4 [0]
  - : Bit 3 [1] 1024 x 768 @ 60 Hz Supported (VESA)
  - : Bit 2 [1] 1024 x 768 @ 70 Hz Supported (VESA)
  - : Bit 1 [1] 1024 x 768 @ 75 Hz Supported (VESA)
  - : Bit 0 [1] 1280 x 1024 @ 75 Hz Supported (VESA)
- Manufacturer's Timing : Bit 7 [1] 1152 x 870 @ 75 Hz Supported (Apple, MacII)
  - : Bit 6-0 [*] Reserved

StandarTiming Identification 1
- Horizontal Active Pixels : 1152
- Aspect Ratio : 4:3
- Refresh Rate(Hz) : 60

StandarTiming Identification 2
- Horizontal Active Pixels : 1280
- Aspect Ratio : 4:3
- Refresh Rate(Hz) : 60

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DDC DATA

StandarTiming Identification 3
Horizontal Active Pixels : 1280
Aspect Ratio : 16:9
Refresh Rate(Hz) : 60

StandarTiming Identification 4
Horizontal Active Pixels : 1440
Aspect Ratio : 16:10
Refresh Rate(Hz) : 60

StandarTiming Identification 5
Horizontal Active Pixels : 1440
Aspect Ratio : 16:10
Refresh Rate(Hz) : 75

StandarTiming Identification 6
Horizontal Active Pixels : 1600
Aspect Ratio : 4:3
Refresh Rate(Hz) : 60

StandarTiming Identification 7
Horizontal Active Pixels : 1680
Aspect Ratio : 16:10
Refresh Rate(Hz) : 60

StandarTiming Identification 8
Horizontal Active Pixels :
Aspect Ratio :
Refresh Rate(Hz) :
Detailed Timing Description 1
Pixel Clock (kHz) : 154000
H Active (pixels) : 1920
H Blanking (pixels) : 160
V Active (lines) : 1200
V Blanking (lines) : 35
H Sync Offset (F Porch) (pixels) : 48
H Sync Pulse Width (pixels) : 32
V Sync Offset (F Porch) (lines) : 3
V Sync Pulse Width (lines) : 6
H Image Size (mm) : 519
V Image Size (mm) : 324
H Border (pixels) : 0
V Border (lines) : 0
Flag #1 : Bit 7 [0] No Interlaced
#2 : Bit 6,5 [0,0] Normal display, no stereo
#3 : Bit 3,4 [1,1] Digital Separate
#4 : Bit 2,1 [0,1] Vsync Negative Polarity, Hsync Positive Polarity
Monitor Serial Number : CS10715000001
Monitor Name : Philips 240BW
Monitor Decription
Min. V Rate(Hz) : 48
Max. V Rate(Hz) : 85
Min. H Rate(kHz) : 24
Max. H Rate(kHz) : 94
Max. Pixel Clock(Mhz) : 210
****

EDID Data (128 bytes)
****

0: 00 1: FF 2: FF 3: FF 4: FF 5: FF 6: FF 7: 00
8: 41 9: 0C 10: 72 11: 08 12: 01 13: 00 14: 00 15: 00
16: 0F 17: 12 18: 01 19: 03 20: 0E 21: 34 22: 20 23: 78
24: EE 25: 49 26: 95 27: A9 28: 54 29: 37 30: AD 31: 25
32: 13 33: 50 34: 54 35: BF 36: EF 37: 80 38: 71 39: 40
40: 81 41: 40 42: 81 43: C0 44: 95 45: 00 46: 95 47: 0F
48: A9 49: 40 50: B3 51: 00 52: 01 53: 01 54: 28 55: 3C
56: 80 57: A0 58: 70 59: B0 60: 23 61: 40 62: 30 63: 20
64: 36 65: 00 66: 07 67: 44 68: 21 69: 00 70: 00 71: 1A
72: 00 73: 00 74: 00 75: FF 76: 00 77: 43 78: 53 79: 31
80: 30 81: 37 82: 31 83: 35 84: 30 85: 30 86: 30 87: 30
88: 30 89: 31 90: 00 91: 00 92: 00 93: FC 94: 00 95: 50
96: 68 97: 69 98: 6C 99: 69 100: 70 101: 73 102: 20 103: 32
104: 34 105: 30 106: 42 107: 57 108: 00 109: 00 110: 00 111: FD
112: 00 113: 30 114: 55 115: 18 116: 5E 117: 15 118: 00 119: 0A
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: 3C

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DDC DATA

DVI
****
EDID Log File
****

Vendor/Product Identification
- Manufacturer Name : PHL
- Product : 0872
- Serial Number :
- Week of Manufacture : 15
- Year of Manufacture : 2008

EDID Structure Version , Revision
- Version # : 01
- Revision # : 03

Basic Display Parameters/Features
- Vedio Input Definition : Bit 7 [1] Digital Signal Level
  - : Bit 6,5 [*] Reserved
  - : Bit 4 [*] Reserved
  - : Bit 3 [*] Reserved
  - : Bit 2 [*] Reserved
  - : Bit 1 [*] Reserved
  - : Bit 0 [0] Interface is signal Not compatible withVESA DEP 1.X
- Max. Horizontal Image Size (mm) : 520
- Max. Vertical Image Size (mm) : 320
- Display Transfer Characteristic : 2.2
- Featuer Support : Bit 7 [1] Standby Supported
  - : Bit 6 [1] Suspend Supported
  - : Bit 5 [1] Active off
  - : Bit 4,3 [0,1] RGB color display
  - : Bit 2 [1] Primary Color Space: sRGB Standard
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- Blue - x : 0.142578125
- Blue - y : 0.0712890625
- White - x : 0.3134765625
- White - y : 0.3291015625

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  - : Bit 6 [0]
  - : Bit 5 [1] 640 x 480 @ 60 Hz Supported (IBM,VGA)
  - : Bit 4 [1] 640 x 480 @ 67 Hz Supported (Apple,MacII)
  - : Bit 3 [1] 640 x 480 @ 72 Hz Supported (VESA)
  - : Bit 2 [1] 640 x 480 @ 75 Hz Supported (VESA)
  - : Bit 1 [1] 800 x 600 @ 56 Hz Supported (VESA)
  - : Bit 0 [1] 800 x 600 @ 60 Hz Supported (VESA)
- Established Timinigs II : Bit 7 [1] 800 x 600 @ 72 Hz Supported (VESA)
  - : Bit 6 [1] 800 x 600 @ 75 Hz Supported (VESA)
  - : Bit 5 [1] 832 x 624 @ 75 Hz Supported (Apple,MacII)
  - : Bit 4 [0]
  - : Bit 3 [1] 1024 x 768 @ 60 Hz Supported (VESA)
  - : Bit 2 [1] 1024 x 768 @ 70 Hz Supported (VESA)
  - : Bit 1 [1] 1024 x 768 @ 75 Hz Supported (VESA)
  - : Bit 0 [1] 1280 x 1024 @ 75 Hz Supported (VESA)
- Manufacturer's Timing : Bit 7 [1] 1152 x 870 @ 75 Hz Supported (Apple, MacII)
  - : Bit 6-0 [*] Reserved

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- Aspect Ratio : 4:3
- Refresh Rate(Hz) : 60

StandarTiming Identification 2
- Horizontal Active Pixels : 1280
- Aspect Ratio : 4:3
- Refresh Rate(Hz) : 60

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DDC DATA

StandarTiming Identification 3
Horizontal Active Pixels : 1280
Aspect Ratio : 16:9
Refresh Rate(Hz) : 60

StandarTiming Identification 4
Horizontal Active Pixels : 1440
Aspect Ratio : 16:10
Refresh Rate(Hz) : 60

StandarTiming Identification 5
Horizontal Active Pixels : 1440
Aspect Ratio : 16:10
Refresh Rate(Hz) : 75

StandarTiming Identification 6
Horizontal Active Pixels : 1600
Aspect Ratio : 4:3
Refresh Rate(Hz) : 60

StandarTiming Identification 7
Horizontal Active Pixels : 1680
Aspect Ratio : 16:10
Refresh Rate(Hz) : 60

StandarTiming Identification 8
Horizontal Active Pixels :
Aspect Ratio :
Refresh Rate(Hz) :
Detailed Timing Description 1
Pixel Clock (kHz) : 154000
H Active (pixels) : 1920
H Blanking (pixels) : 160
V Active (lines) : 1200
V Blanking (lines) : 35
H Sync Offset (F Porch) (pixels) : 48
H Sync Pulse Width (pixels) : 32
V Sync Offset (F Porch) (lines) : 3
V Sync Pulse Width (lines) : 6
H Image Size (mm) : 519
V Image Size (mm) : 324
H Border (pixels) : 0
V Border (lines) : 0
Flag #1 : Bit 7 [0] No-Interlaced
#2 : Bit 6,5 [0,0] Normal display, no stereo
#3 : Bit 3,4 [1,1] Digital Separate
#4 : Bit 2,1 [0,1] Vsync Negative Polarity, Hsync Positive Polarity
Monitor Serial Number : CS10715000001
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Max. V Rate(Hz) : 85
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Max. H Rate(kHz) : 94
Max. Pixel Clock(Mhz) : 170
****

EDID Data (128 bytes)
****

0: 00 1: FF 2: FF 3: FF 4: FF 5: FF 6: FF 7: 00
8: 41 9: 0C 10: 72 11: 08 12: 01 13: 00 14: 00 15: 00
16: 0F 17: 12 18: 01 19: 03 20: 80 21: 34 22: 20 23: 78
24: EE 25: 49 26: 95 27: A9 28: 54 29: 37 30: AD 31: 25
32: 13 33: 50 34: 54 35: BF 36: EF 37: 80 38: 71 39: 40
40: 81 41: 40 42: 81 43: C0 44: 95 45: 00 46: 95 47: 0F
48: A9 49: 40 50: B3 51: 00 52: 01 53: 01 54: 28 55: 3C
56: 80 57: A0 58: 70 59: B0 60: 23 61: 40 62: 30 63: 20
64: 36 65: 00 66: 07 67: 44 68: 21 69: 00 70: 00 71: 1A
72: 00 73: 00 74: 00 75: FF 76: 00 77: 43 78: 53 79: 31
80: 30 81: 37 82: 31 83: 35 84: 30 85: 30 86: 30 87: 30
88: 30 89: 31 90: 00 91: 00 92: 00 93: FC 94: 00 95: 50
96: 68 97: 69 98: 6C 99: 69 100: 70 101: 73 102: 20 103: 32
104: 34 105: 30 106: 42 107: 57 108: 00 109: 00 110: 00 111: FD
112: 00 113: 30 114: 55 115: 18 116: 5E 117: 11 118: 00 119: 0A
120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: CE

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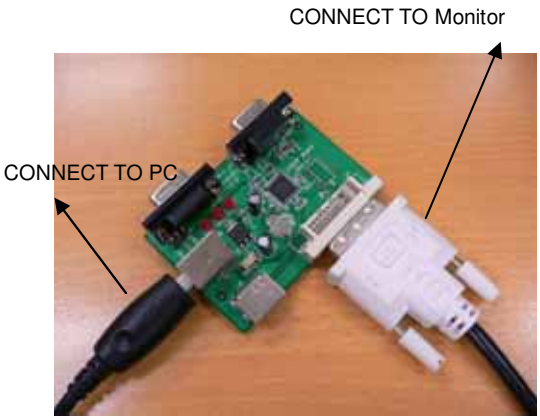
Firmware Upgrade for CPU

Step 1 Connection method D/L BD

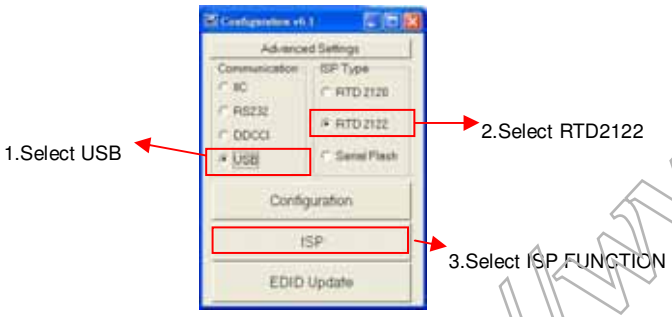


Step 2 Execute RTD Debug Tool

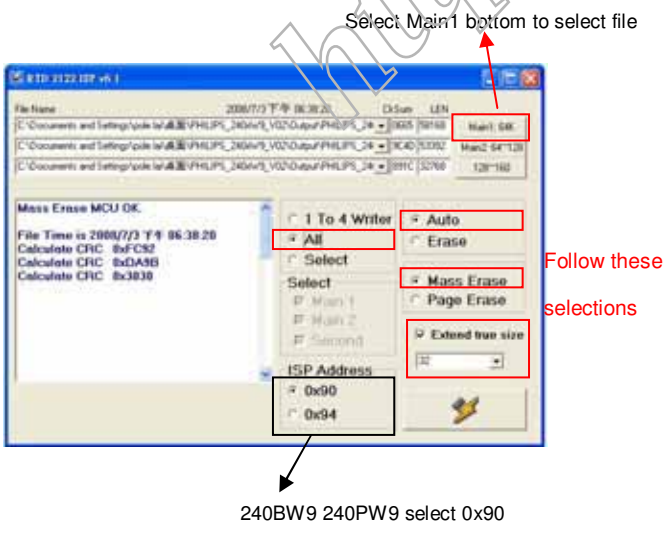
Step 3 Select USB

Step 4 Select RTD2122

Step 5 Select ISP FUNCTION

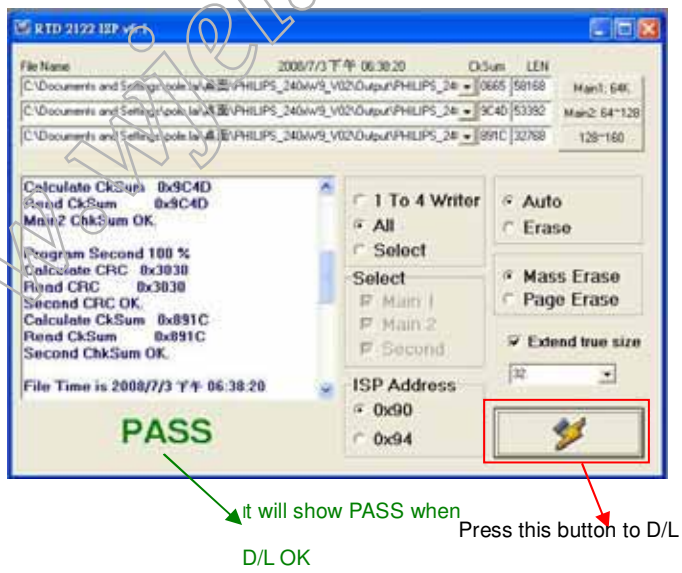


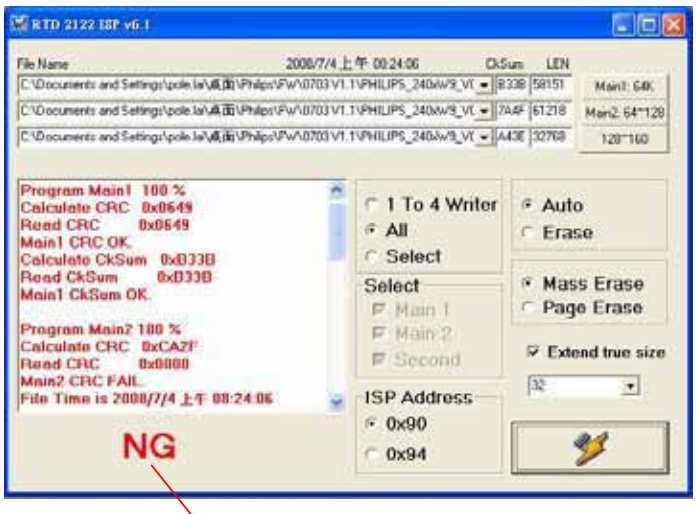
Step 6 Select ALL, ISP Address, AUTO, Mass Erase



Step 7 Select *.H00 file

Step 8 Press this button to D/L





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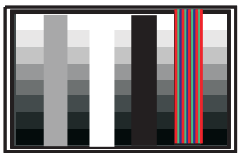
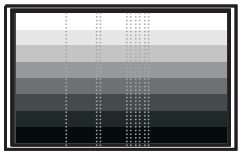
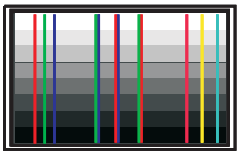
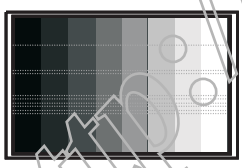
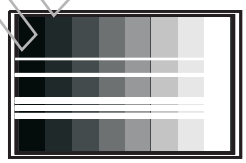
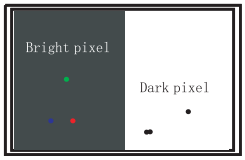
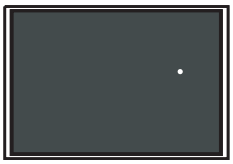
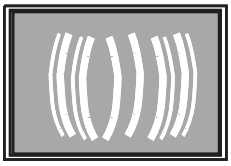
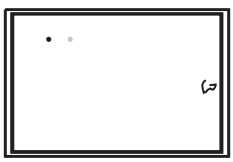
Failure Mode Of Panel

Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.
It is not necessary to repair circuit board. Simply follow the mechanical instruction on this manual to eliminate failure by replace LCD panel.

Failure description	Phenomenon
Vertical block defect	
Vertical dim lines	
Vertical lines defect (Always bright or dark)	
Horizontal block defect	
Horizontal dim lines	
Horizontal lines defect (Always bright or dark)	
Has bright or dark pixel	
Polarizer has bubbles	
Polarizer has bubbles	
Foreign material inside polarizer. It shows liner or dot shape.	
Concentric circle formed	
Bottom back light of LCD is brighter than normal	
Back light un-uniformity	
Backlight has foreign material. Black or white color, liner or circular type	

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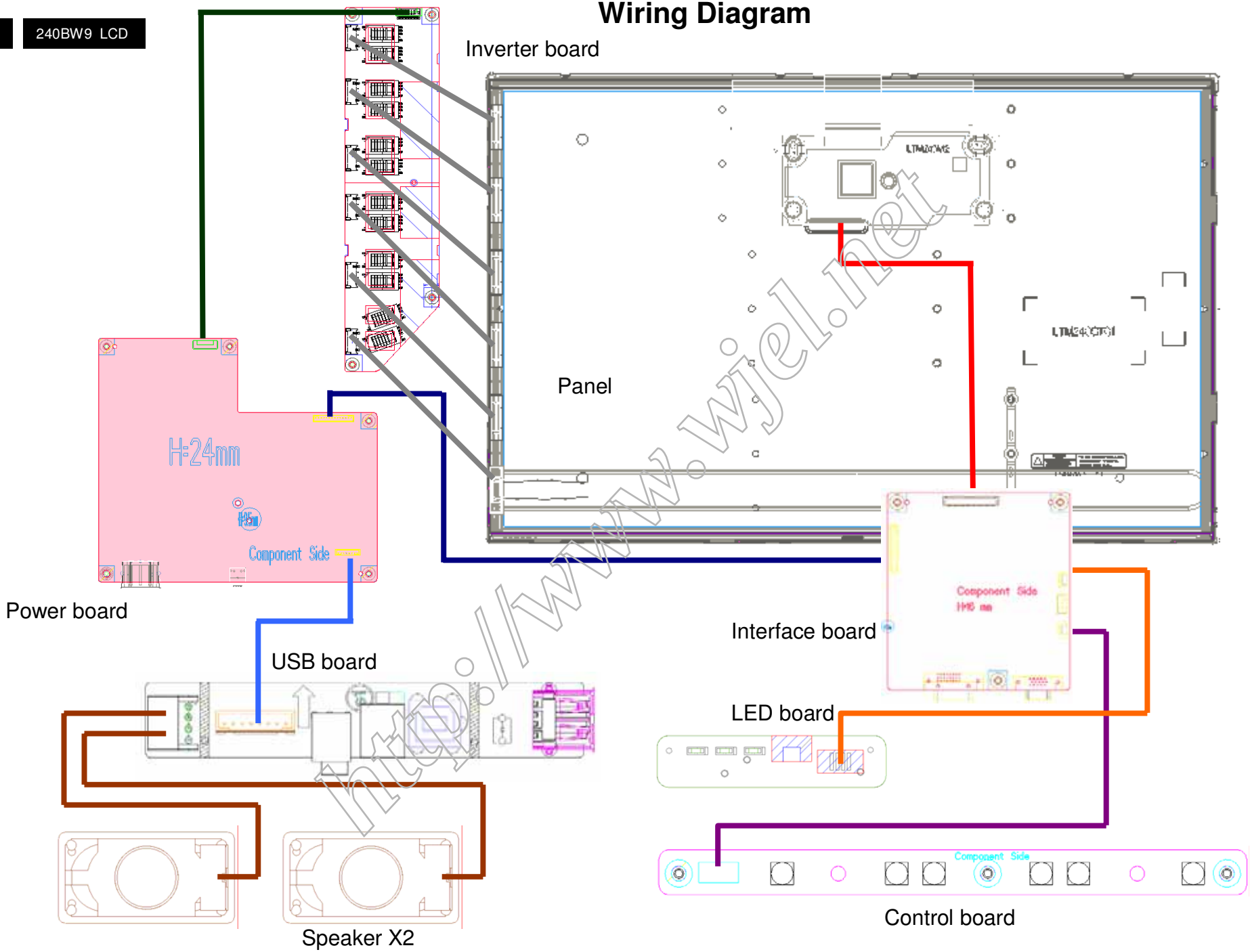
Wiring Diagram



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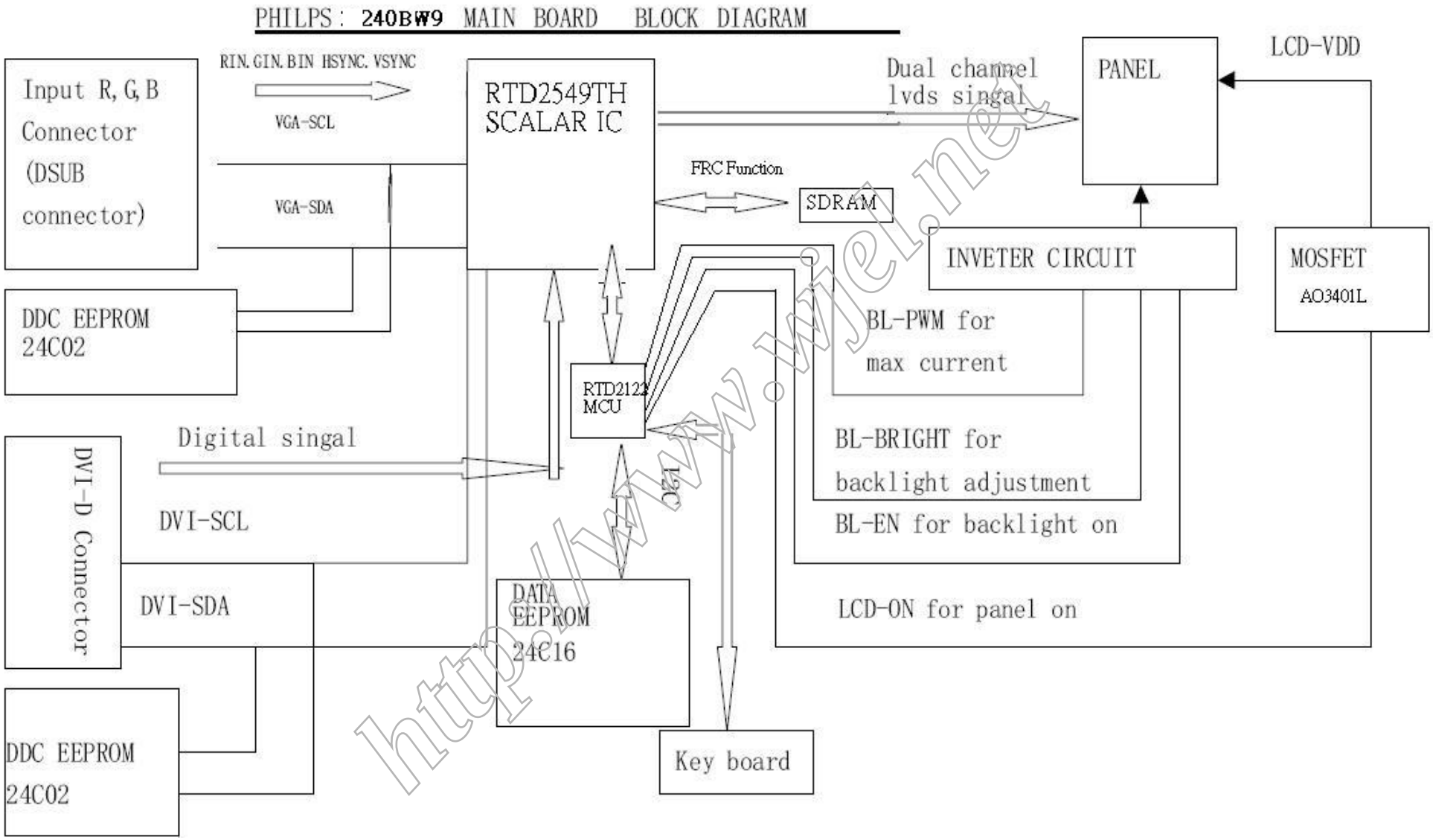
Block Diagram



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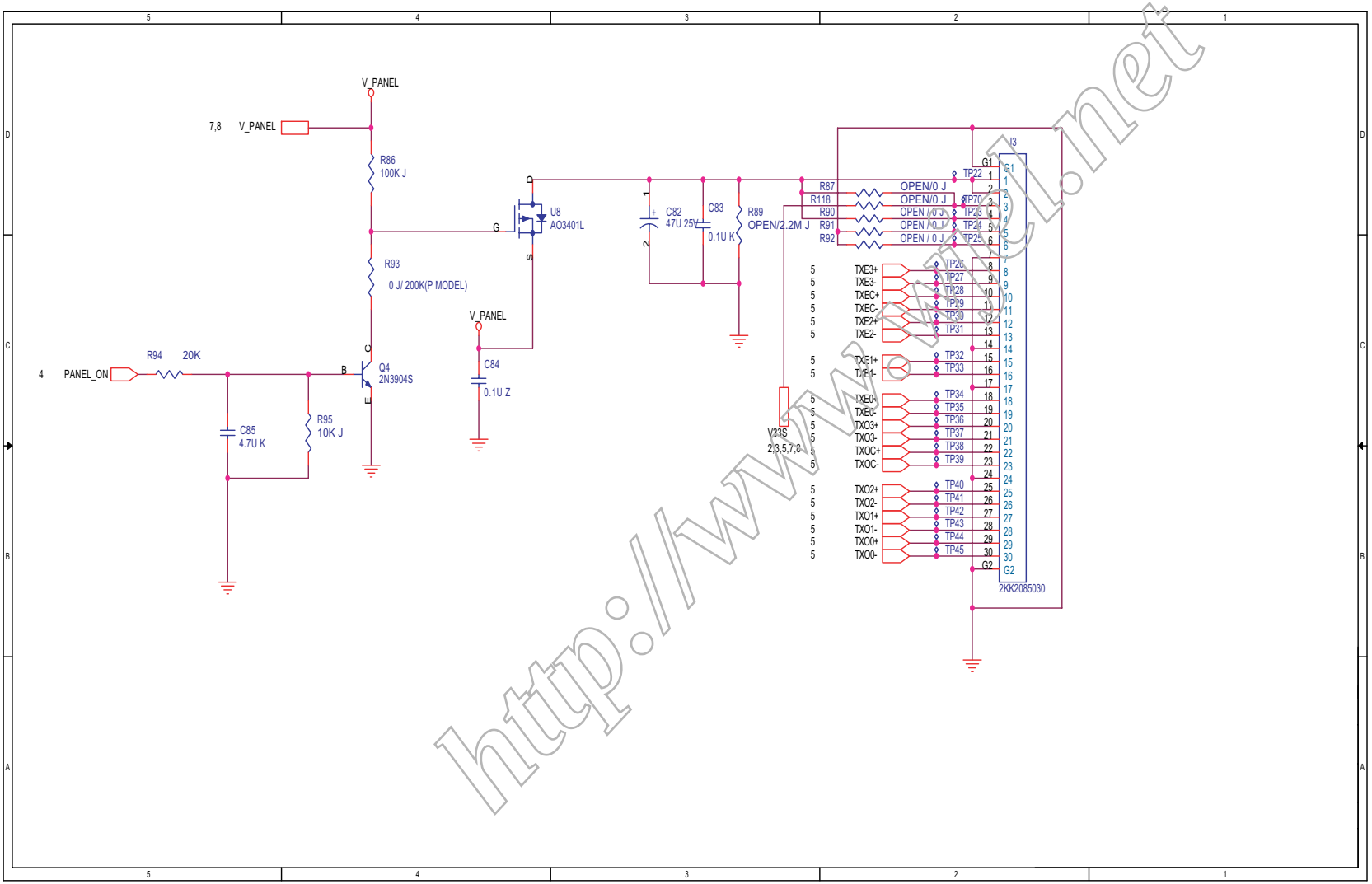
Scaler Diagram



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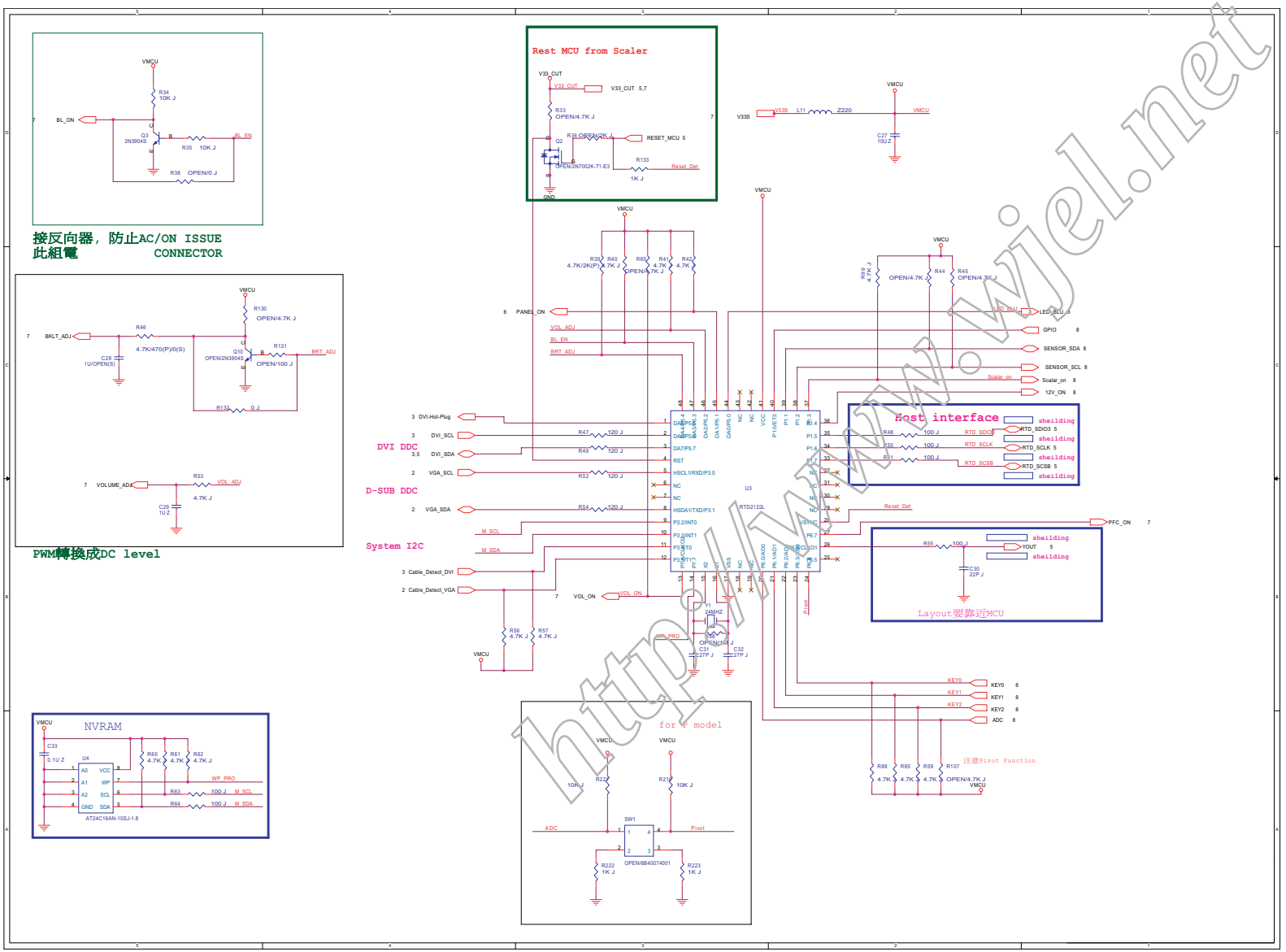
C82	D3
C83	D3
C84	C4
C85	C5
J3	C2
Q4	C4
R86	D4
R87	D2
R118	D2
R89	D3
R90	D2
R9	D2
R92	D2
R93	C4
R94	C5
R95	C4
U8	D4

Scaler Diagram



C27	D2	R42	D3	R133	D3
C28	C5	R53	B5	SW1	A3
C29	B5	R56	B4	U3	B3
C30	B2	R57	B3	U4	A5
C31	B3	R59	A2	R222	A3
C32	B3	R60	A5	R223	A3
C33	A5	R61	A5	R131	C4
L11	D2	R62	A5	Y1	B3
Q2	D3	R85	A2		
Q3	D5	R88	A2		
Q10	C5	R99	C2		
R33	D3	R46	C5		
R44	C2	R47	C3		
R45	C2	R49	C3		
R65	D3	R52	B3		
R107	A2	R54	B3		
R130	C5	R48	C2		
R34	D5	R50	C2		
R35	D5	R51	C2		
R36	D3	R55	B2		
R38	D5	R63	A5		
R39	D3	R64	A5		
R40	D3	R58	B3		
R41	D3	R219	A3		
R132	C5	R221	A3		

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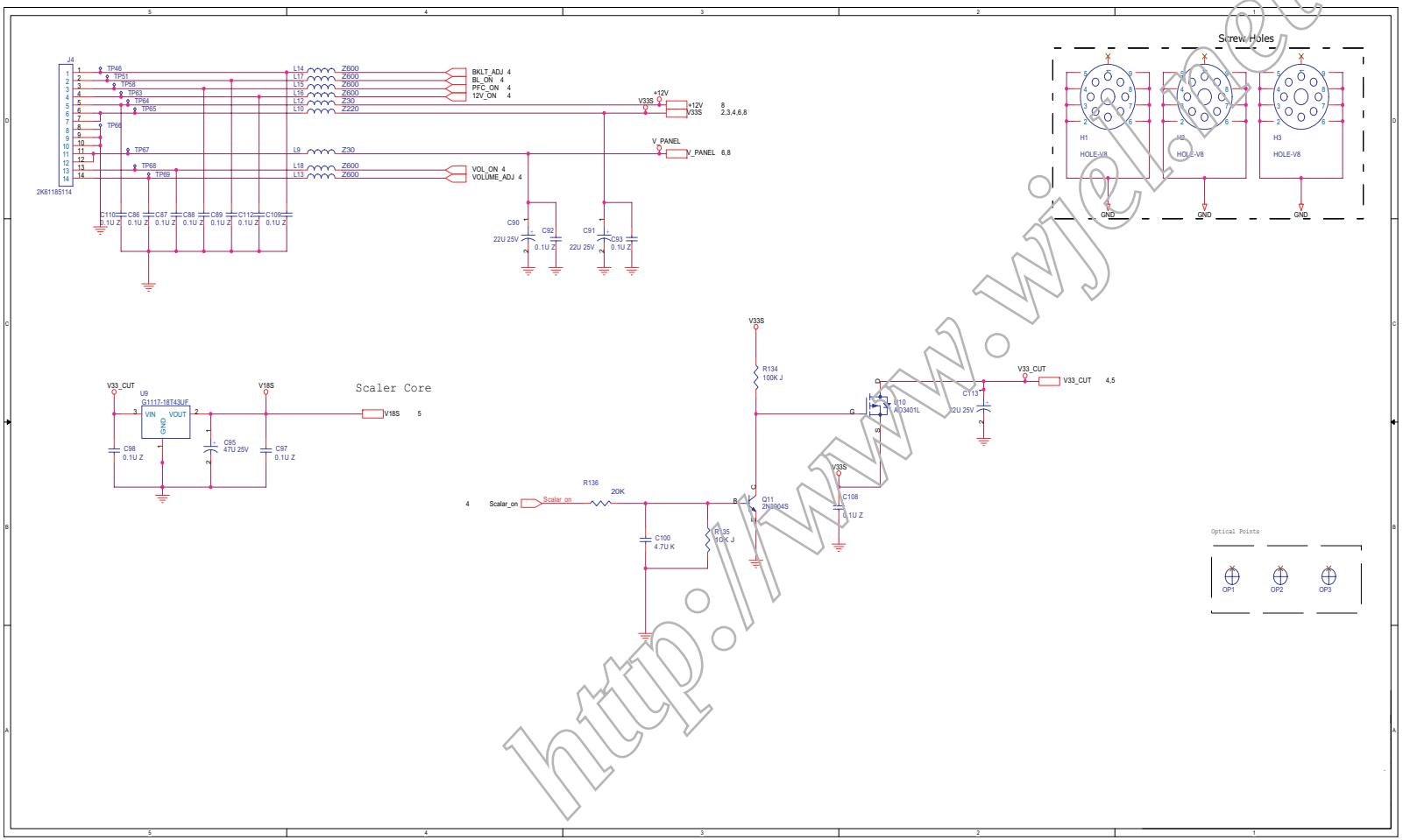
Scaler Diagram



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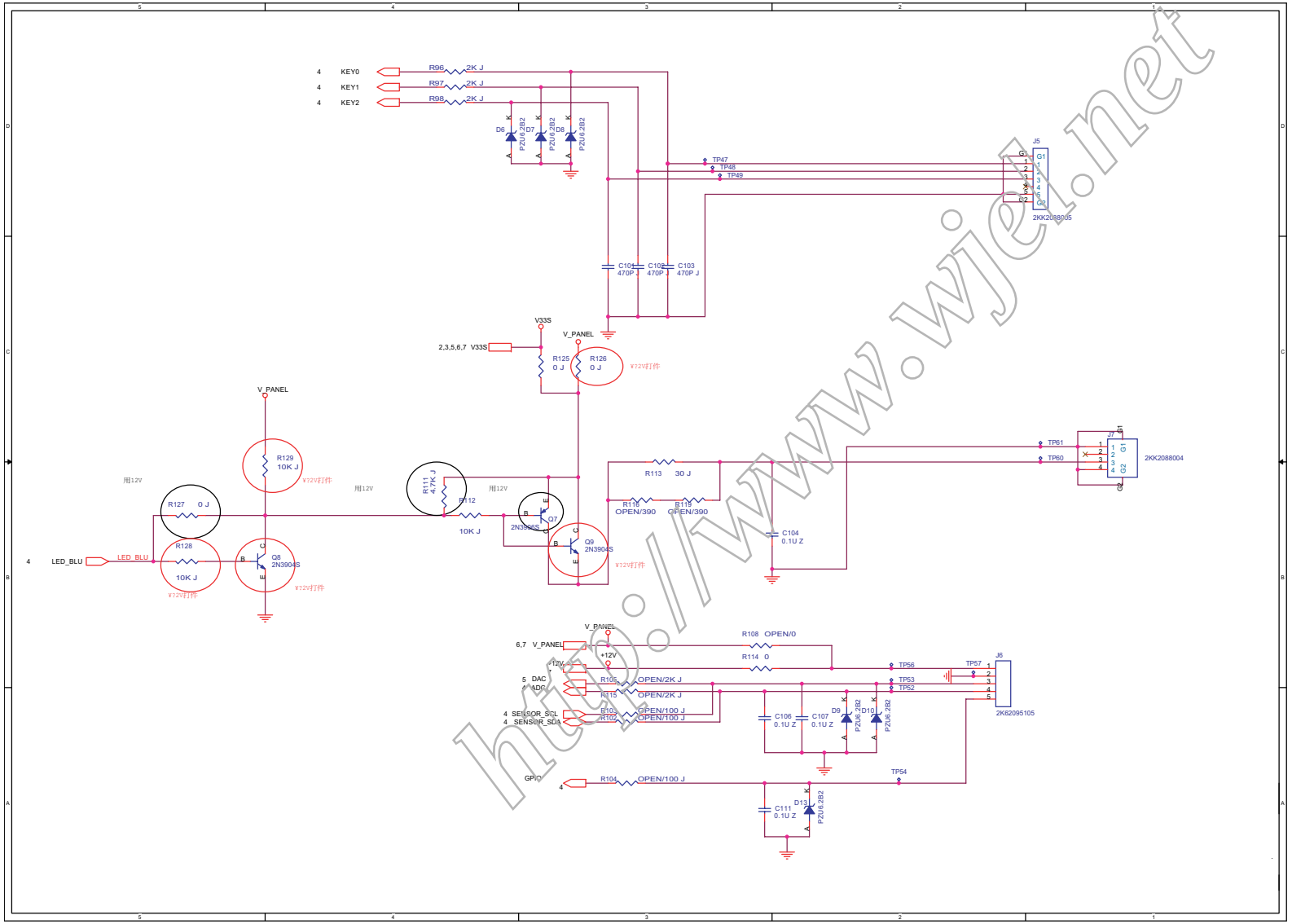
C86	D5	L16	D4
C87	D5	L17	D4
C88	D5	L18	D4
C89	D5	Q11	B3
C93	C3	R134	C3
C97	B5	R135	B3
C98	B5	R136	B3
C108	B2	U9	C5
C109	D5	U10	C2
C112	D5		
C90	C4		
C113	C2		
C91	C3		
C92	C4		
C110	D5		
C95	B5		
C100	B3		
J4	D5		
L9	D4		
L12	D4		
L10	D4		
L13	D4		
L14	D4		
L15	D4		

Scaler Diagram



C101	C3	R111	B4
C102	C3	R112	B4
C103	C3	R128	B5
C104	B3	R129	C5
C106	A3	R113	B3
C107	A2	R114	B2
C111	A3	R116	B3
D6	D4	R119	B3
D7	D3	R125	C3
D8	D3	R126	C3
D9	A2	R127	B5
D10	A2	R105	A3
D13	A2	R115	A3
J5	D1	R108	B2
J6	B2		
J7	C1		
Q7	B3		
Q8	B5		
Q9	B3		
R96	D4		
R97	D4		
R98	D4		
R102	A3		
R103	A3		
R104	A3		

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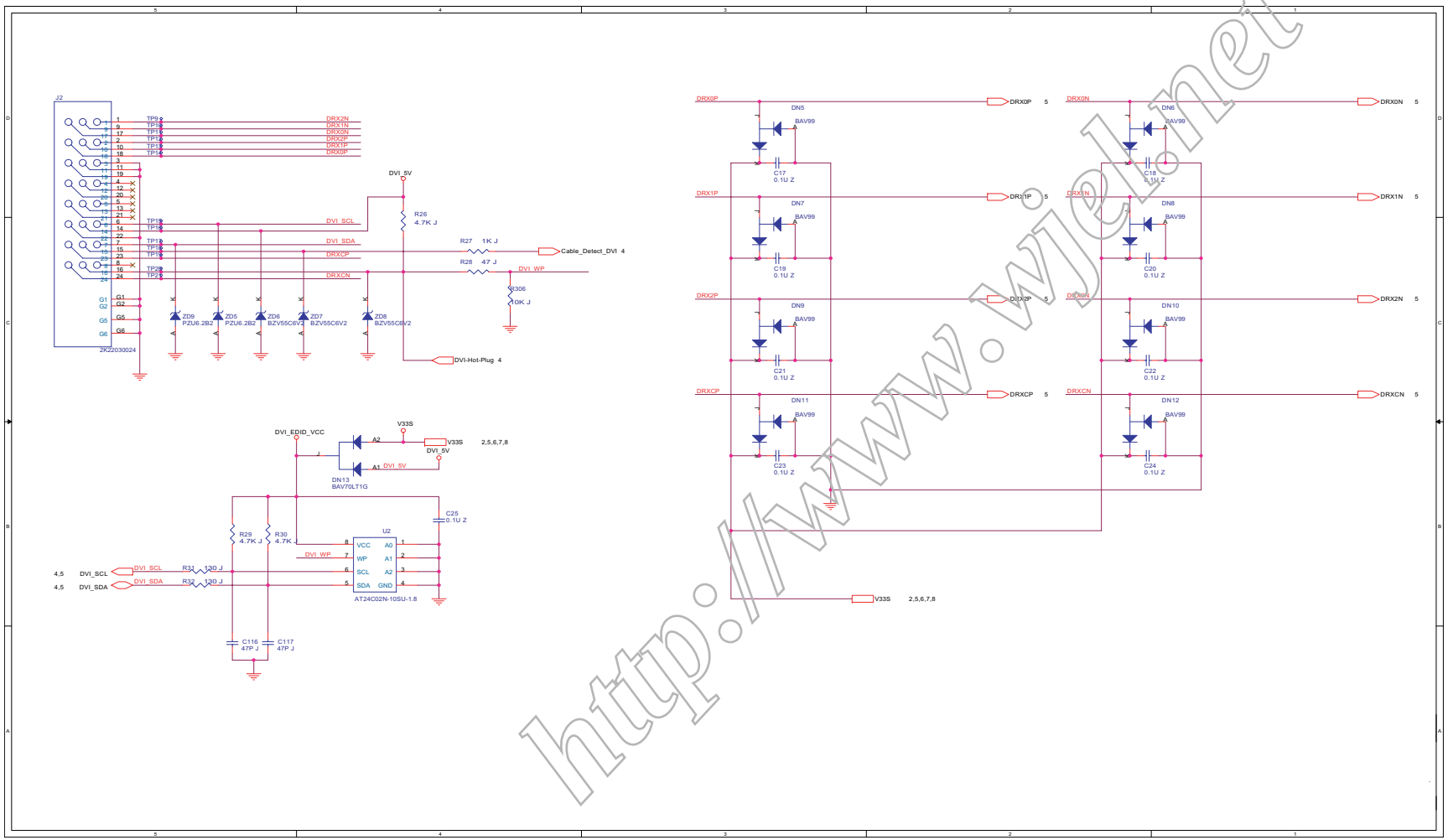
Scaler Diagram



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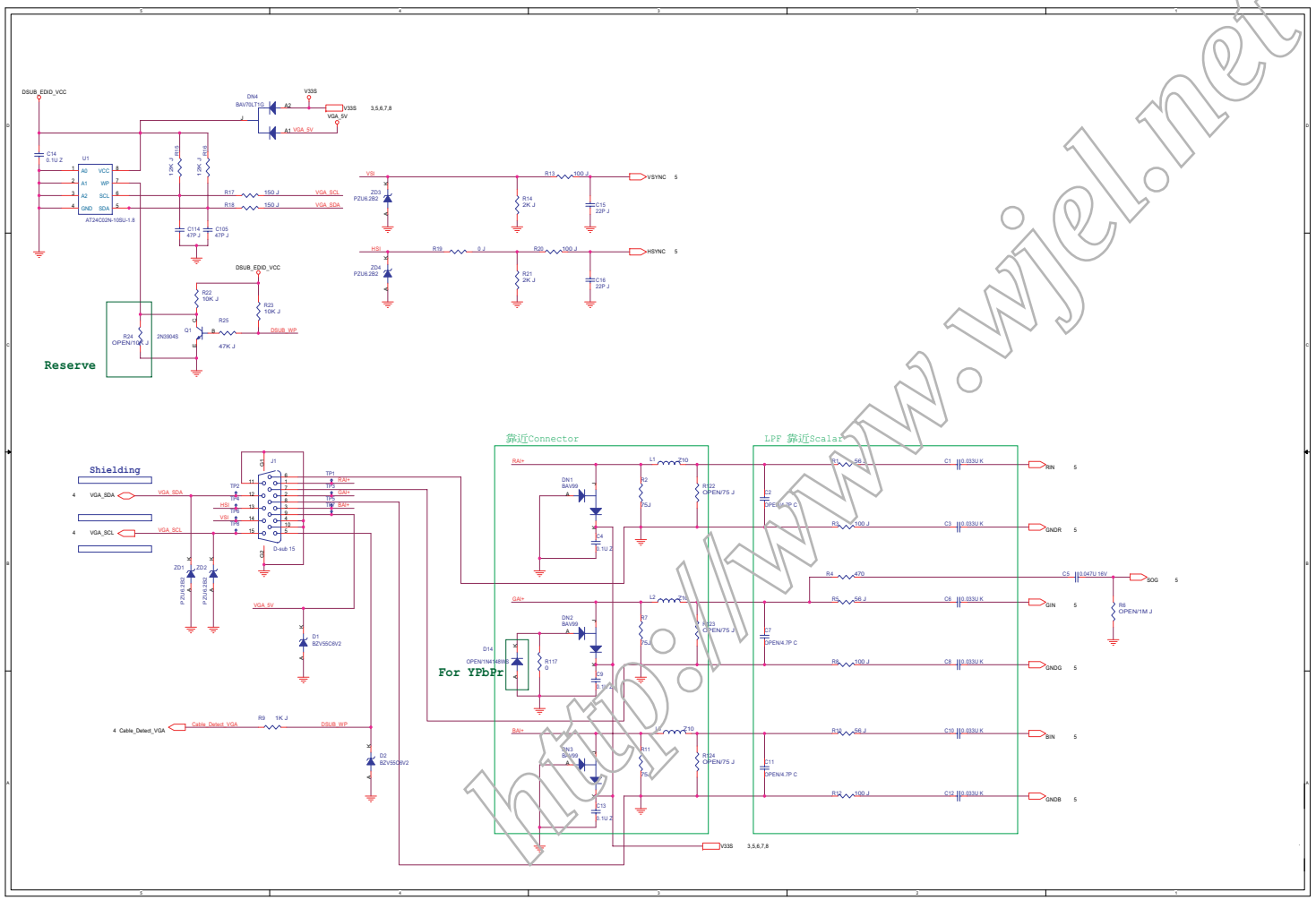
C17	D3	R31	B5
C18	D2	R32	B5
C19	C3	R306	C4
C20	C2	U2	B4
C21	C3	ZD5	C5
C22	C2	ZD9	C5
C23	B3	ZD6	C5
C24	B2	ZD7	C5
C25	B2	ZD8	C4
C116	A5	R27	C4
C117	A5	R28	C4
DN5	D3		
DN6	D2		
DN7	C3		
DN8	C2		
DN9	C3		
DN10	C2		
DN11	B3		
DN12	B2		
DN13	B4		
J2	D5		
R26	C4		
R29	B5		
R30	B5		

Scaler Diagram



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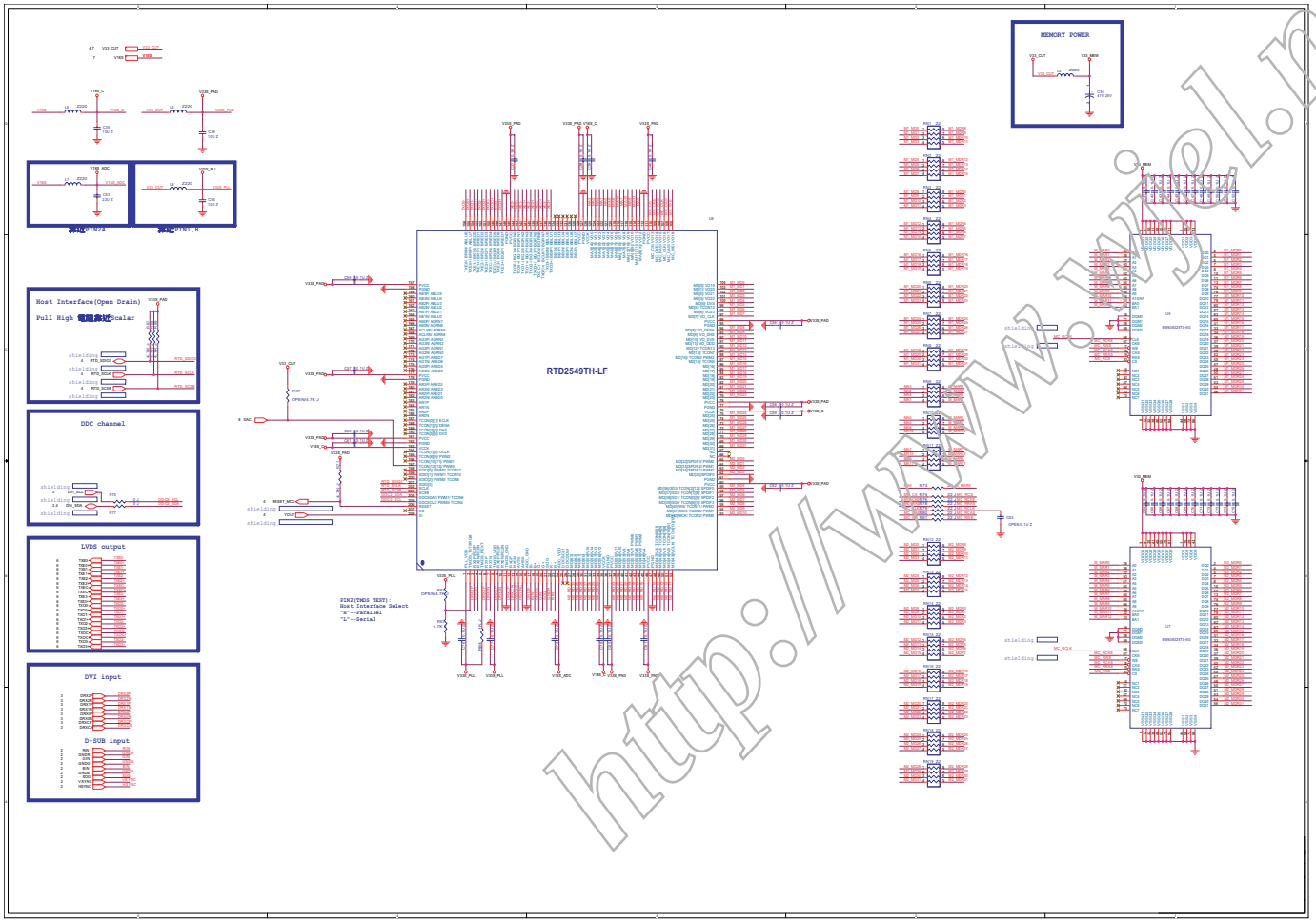
C1	B2	R1	B2	ZD1	B5
C3	B2	R5	B2	ZD2	B5
C6	B2	R10	A2	ZD3	D4
C8	B2	R2	B3	ZD4	C4
C10	A2	R7	B3	L2	B3
C12	A2	R11	A3	L3	A3
C2	B3	R3	B2	Q1	C5
C7	B3	R8	A2	R123	B3
C11	A3	R12	A2	R124	A3
C4	B3	R13	D3	U1	D5
C9	A3	R20	C3	J1	B5
C13	A3	R4	B2	L1	B3
C14	D5	R6	B1	R117	B3
C5	B1	R9	A4	R122	B3
C15	D3	R14	D4		
C16	C3	R21	C4		
C105	D5	R15	D5		
C114	D5	R16	D5		
D1	B4	R17	D5		
D2	A4	R18	D5		
D14	B3	R19	C4		
DN1	B3	R22	C5		
DN2	B3	R23	C5		
DN3	A3	R24	C5		
DN4	D4	R25	C5		

Scaler Diagram



C35	D5	C59	C3	R137	C4	R71	B4
C36	D5	C60	C4	R84	B4	R83	B4
C54	D5	C61	C4	RN1	D2	R73	B2
C37	D4	C62	B3	RN2	D2	R74	B2
C38	D3	C64	B1	RN3	D2	R76	B2
C39	D3	C65	B1	RN4	D2	R78	B2
C40	D3	C66	B1	RN5	C2	RN19	A2
C41	D1	C67	B1	U5 U7	C1	RN8	C2
C42	D1	C68	B1	U6	C3	RN9	C2
C43	D1	C69	B1	C46	D1	RN10	C2
C44	D1	C70	B1	C47	D1	RN11	B2
C45	D1	C71	B1	C48	D1	RN12	B2
C53	D5	C72	B1	C49	D1	RN13	B2
C63	B2	C73	B1	C50	D1	RN18	A2
C94	D1	C74	B1	C51	D1	R75	B5
L4	D1	C75	B1	C52	C4	R77	B5
L5	D5	C76	B4	C55	C2	R82	B4
L6	D5	C77	B4	C56	C2	RN14	B2
L7	D5	C78	B3	C57	C4	RN15	B2
L8	D5	C79	B3	C58	C3	RN16	B2
R67	C5	C80	B4	R79	B2	RN17	A2
R68	C5	C81	B3	R80	B2		
R69	C5	RN7	C2	R81	B2		

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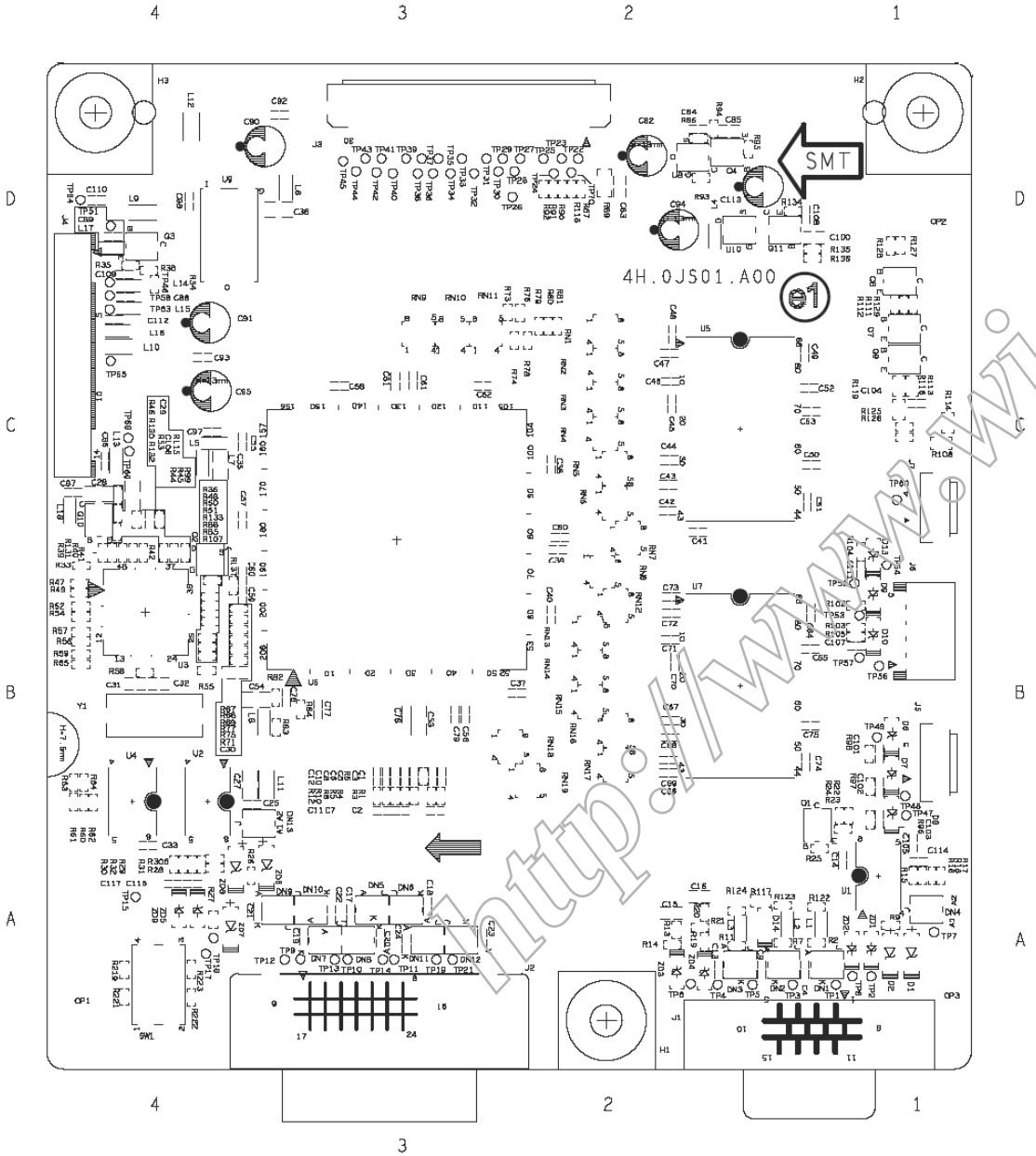
Scaler Diagram



D1:R136
D1:R135
D1:R134
D1:R129
D1:R126
D1:R127
D1:R95
D1:R112
D1:R111
D1:Q10
D1:Q11
D1:Q8
D1:C113
D1:C100
D1:C108
D2:R89
D2:R94
D2:R93
D2:R92
D2:R91
D2:R90
D2:R87
D2:R86
D2:R118
D2:U8
D2:Q4
D2:L4
D2:J3
D2:C94
D2:C82
D2:C85
D2:C83
D2:C84
D3:L6
D3:C36
D4:R39
D4:R38
D4:R35
D4:R34
D4:Q3
D4:L9
D4:L12
D4:L17
D4:L15
D4:L14
D4:C100
D4:C98
D4:C92
D4:C99
D4:C88
D4:C110
D4:C109
B4:R51
B4:R50
B4:R49
B4:R48
B4:R47
B4:R36
B4:Q2
B4:L11
B4:L8
B4:C54
B4:C27
B4:C32
B4:C31
B4:C30
B4:C60
B4:C59
B4:C25
B4:K6/4
B4:R64
B4:R62
B4:R61
B4:R60
B4:R59
B4:R58
B4:R57
B4:R56
B4:R55
B4:R54
B4:R52

C1:D13
C1:R119
C1:R116
C1:R113
C1:R114
C1:R108
C1:R126
C1:R125
C1:R104
C1:Q9
C1:J7
C1:C63
C1:C52
C1:C51
C1:C50
C1:C49
C1:C111
C1:C104
C2:U5
C2:RN7
C2:RN6
C2:RN5
C2:RN4
C2:RN3
C2:RN2
C2:RN1
C2:R81
C2:R80
C2:R79
C2:R78
C2:R76
C2:R74
C2:C60
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C2:C47
C2:C46
C2:C45
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C2:C42
C2:C41
C2:C39
C2:C38
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C2:RN11
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C3:C81
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C3:C61
C3:C58
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C4:R42
C4:R41
C4:R40
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C4:R115
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C4:L7
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C4:C97
C4:C73
C4:C87
C4:C86
C4:C57
C4:C55
C4:C112
C4:C106

B1:D9
B1:D8
B1:D7
B1:D6
B1:D10
B1:R98
B1:R97
B1:R96
B1:R105
B1:R102
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B2:U7
B2:U8
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B2:RN8
B2:RN7
B2:RN6
B2:RN5
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B2:C73
B2:C72
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B3:R10
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B3:C53
B3:C8
B3:C79
B3:C78
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B3:C7
B3:C6
B3:C56
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B3:C12
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B3:C10
B3:C1
B4:U3
B4:Y1
B4:U4
B4:U2
B4:R137
B4:R133
B4:R88
B4:R85
B4:R107
B4:R65
B4:R83
B4:R82
B4:R75
B4:R71
B4:R69
B4:R68
A4:ZD7
A4:ZD6
A4:ZD8
A4:C117
A4:C116
A4:C33
A4:C21

Information
Y1: 1220
Y2: 2440
Y3: 3660
X1: 3360
X2: 2240
X3: 1120

Top Side
A1:ZD2
A1:ZD1
A1:U1
A1:R117
A1:R124
A1:R123
A1:R122
A1:R9
A1:R7
A1:R25
A1:R24
A1:R23
A1:R22
A1:R2
A1:R18
A1:R17
A1:R16
A1:R15
A1:R11
A1:Q1
A1:L3
A1:L2
A1:L1
A1:J1
A1:DN4
A1:DN2
A1:DN1
A1:D14
A1:D2
A1:D1
A1:C114
A1:C105
A1:C9
A1:C4
A1:C14
A1:C103
A2:ZD4
A2:ZD3
A2:R21
A2:R20
A2:R19
A2:R14
A2:R13
A2:DN3
A2:C16
A2:C15
A2:C13
A2:C12
A3:DNB
A3:DN7
A3:DN6
A3:DN5
A3:DN12
A3:DN11
A3:DN10
A3:C24
A3:C23
A3:C22
A3:C20
A3:C19
A3:C18
A3:C17
A3:SW1
A4:ZD9
A4:ZD5
A4:R223
A4:R222
A4:R221
A4:R219
A4:R32
A4:R31
A4:R306
A4:R30
A4:R29
A4:R28
A4:R27
A4:R26
A4:DN13
A4:DN9

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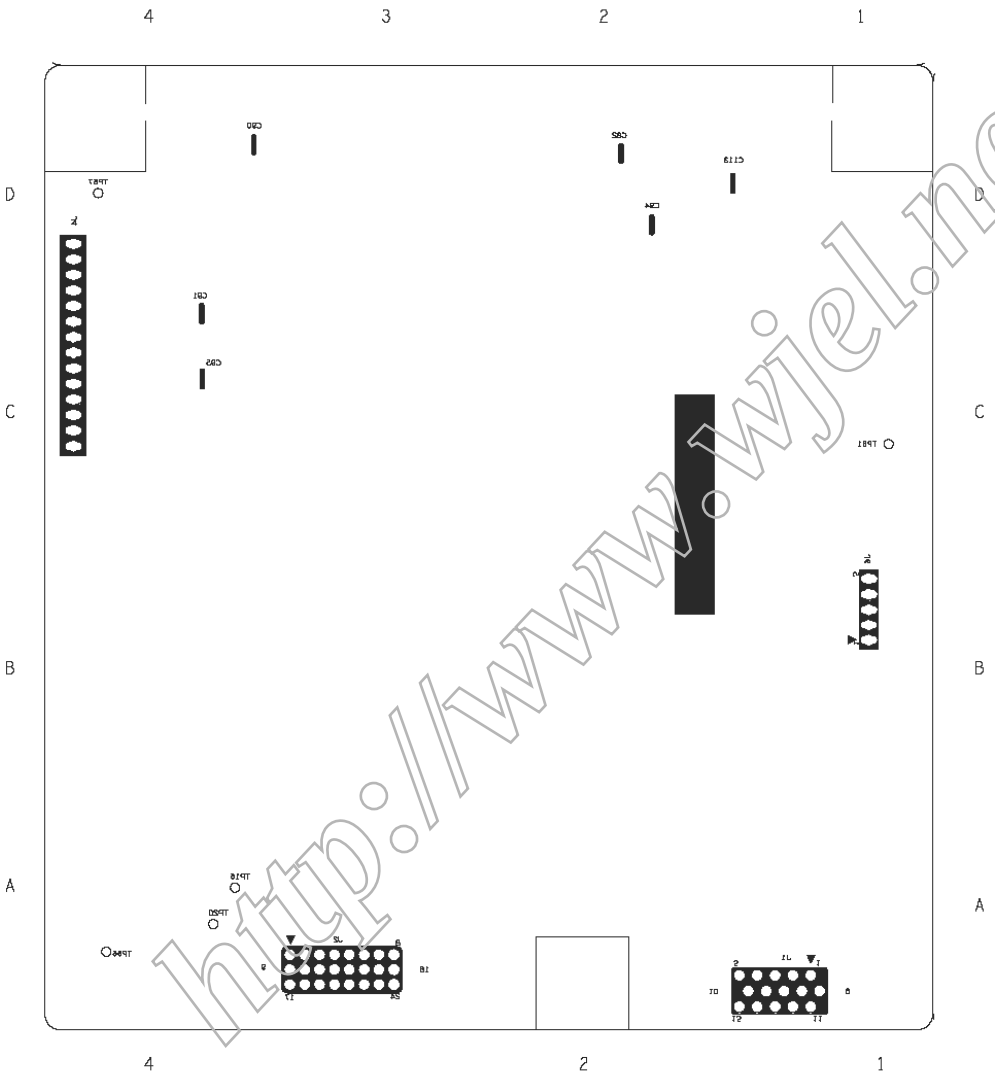
Scaler Diagram



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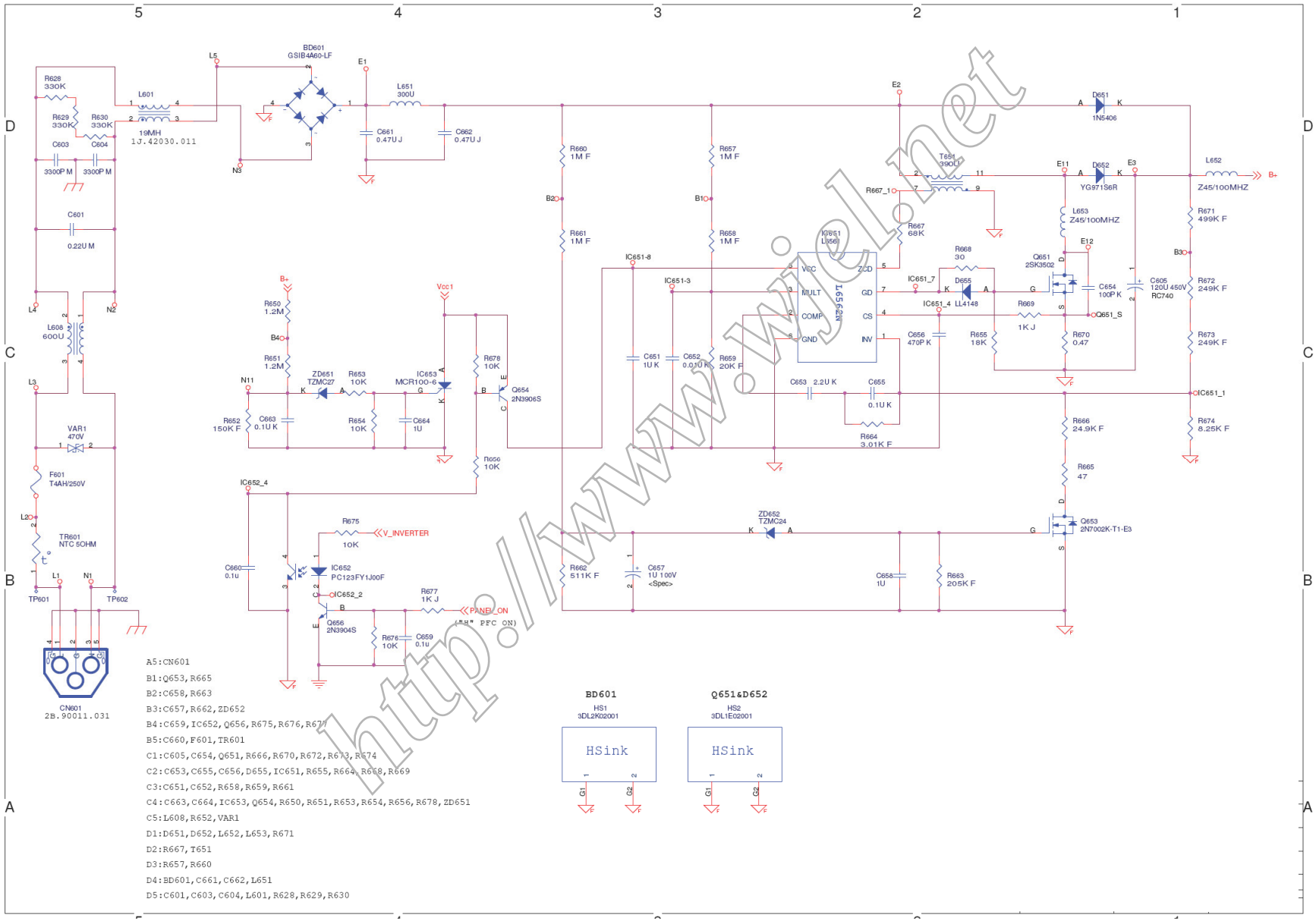
Power Diagram



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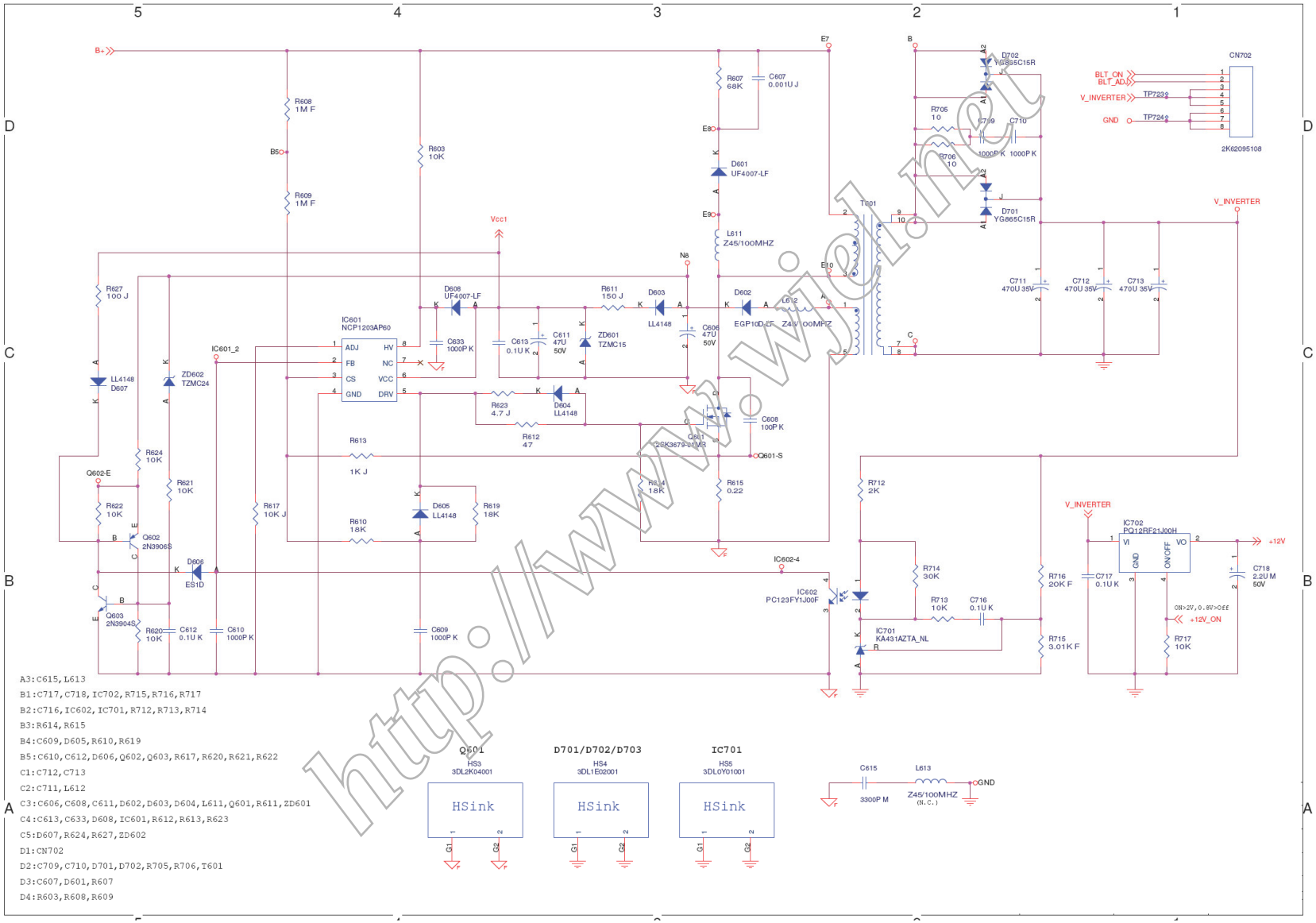

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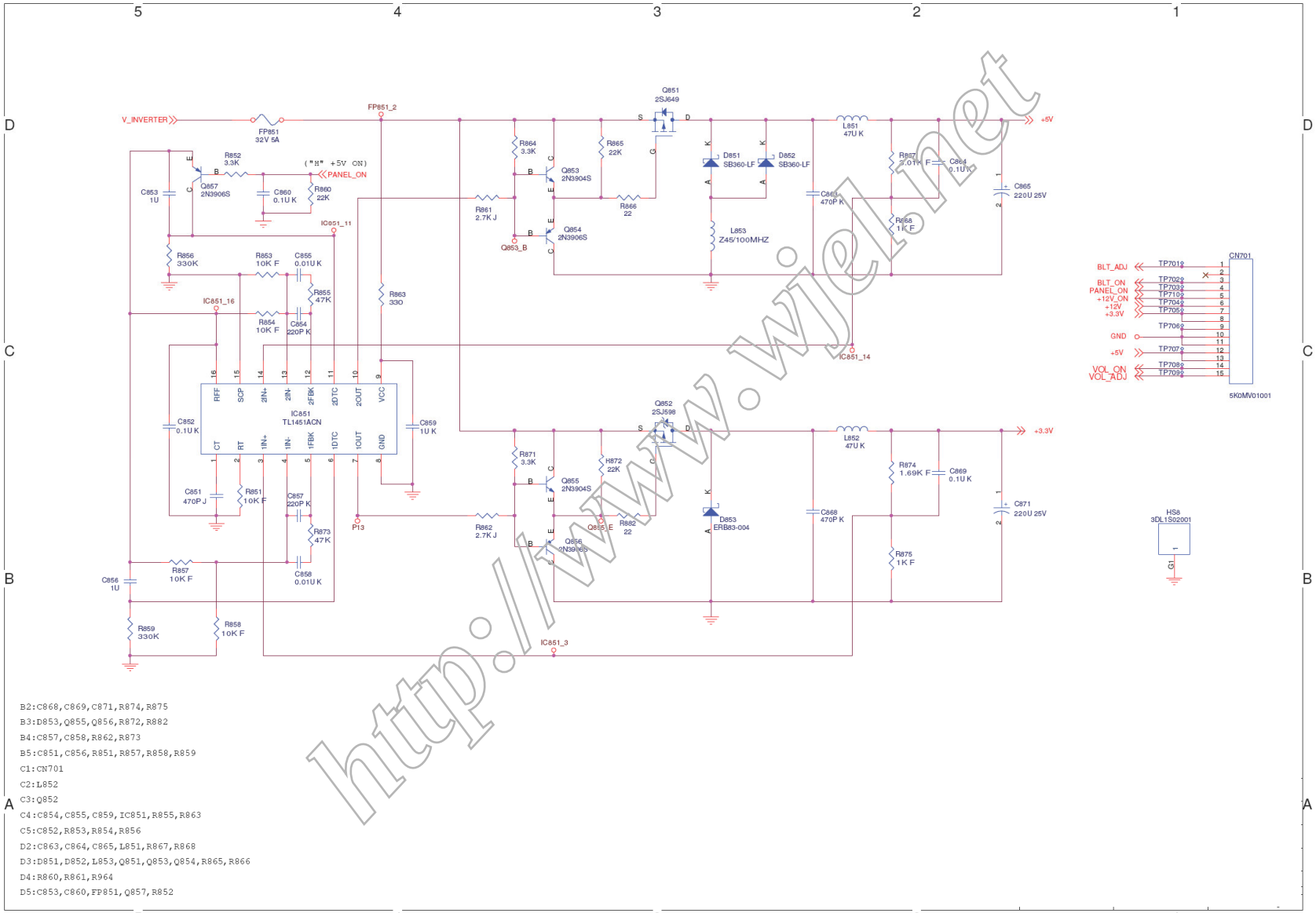

B2:C868,C869,C871,R874,R875
B3:D853,Q855,Q856,R872,R882
B4:C857,C858,R862,R873
B5:C851,C856,R851,R857,R858,R859
C1:CN701
C2:L852
C3:Q852
C4:C854,C855,C859,IC851,R855,R863
C5:C852,R853,R854,R856
D2:C863,C864,C865,L851,R867,R868
D3:D851,D852,L853,Q851,Q853,Q854,R865,R866
D4:R860,R861,R964
D5:C853,C860,FP851,Q857,R852

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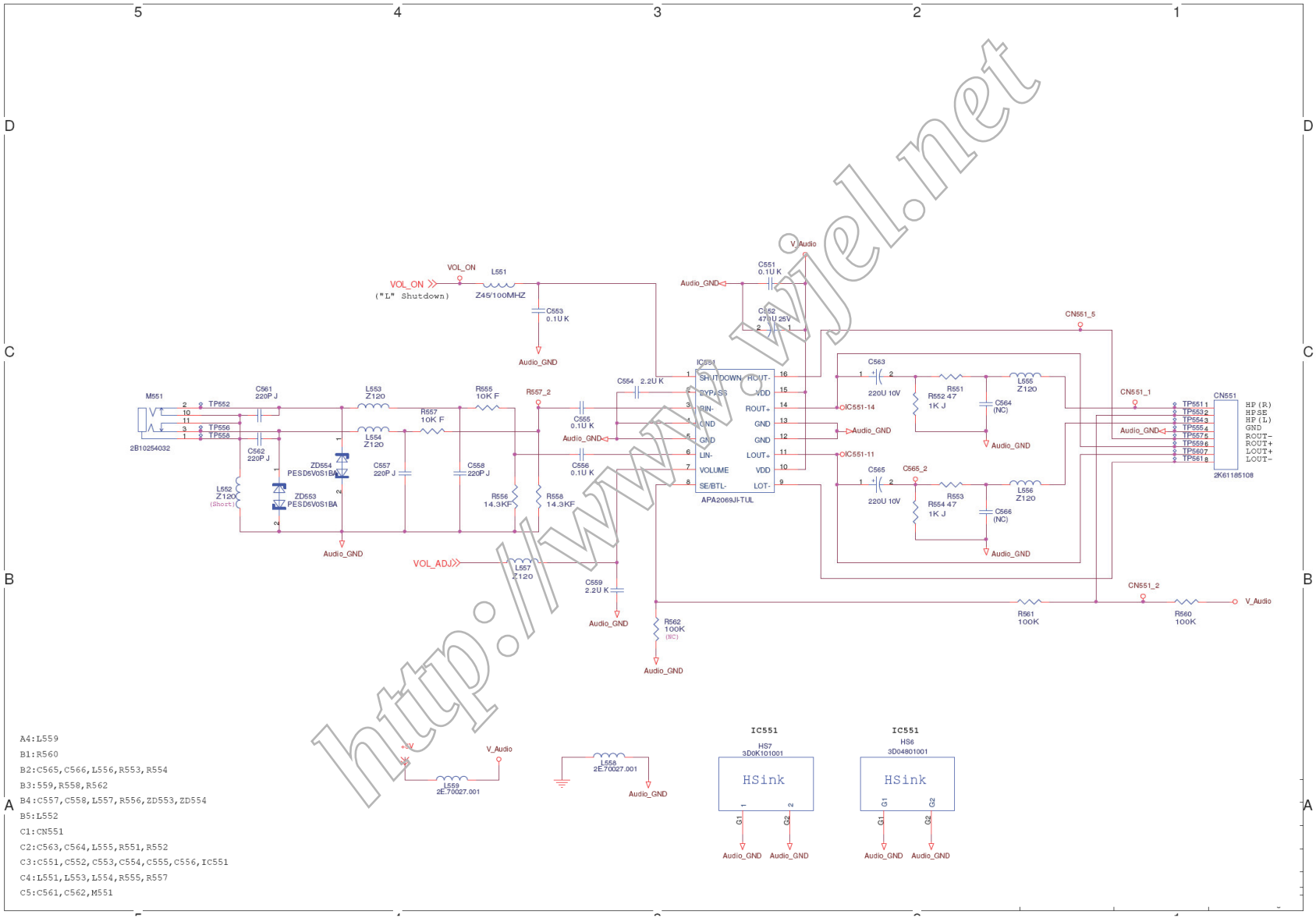
Power Diagram



A4:L559
B1:R560
B2:C565,C566,L556,R553,R554
B3:559,R558,R562
B4:C557,C558,L557,R556,ZD553,ZD554
B5:L552
C1:CN551
C2:C563,C564,L555,R551,R552
C3:C551,C552,C553,C554,C555,C556,IC551
C4:L551,L553,L554,R555,R557
C5:C561,C562,M551

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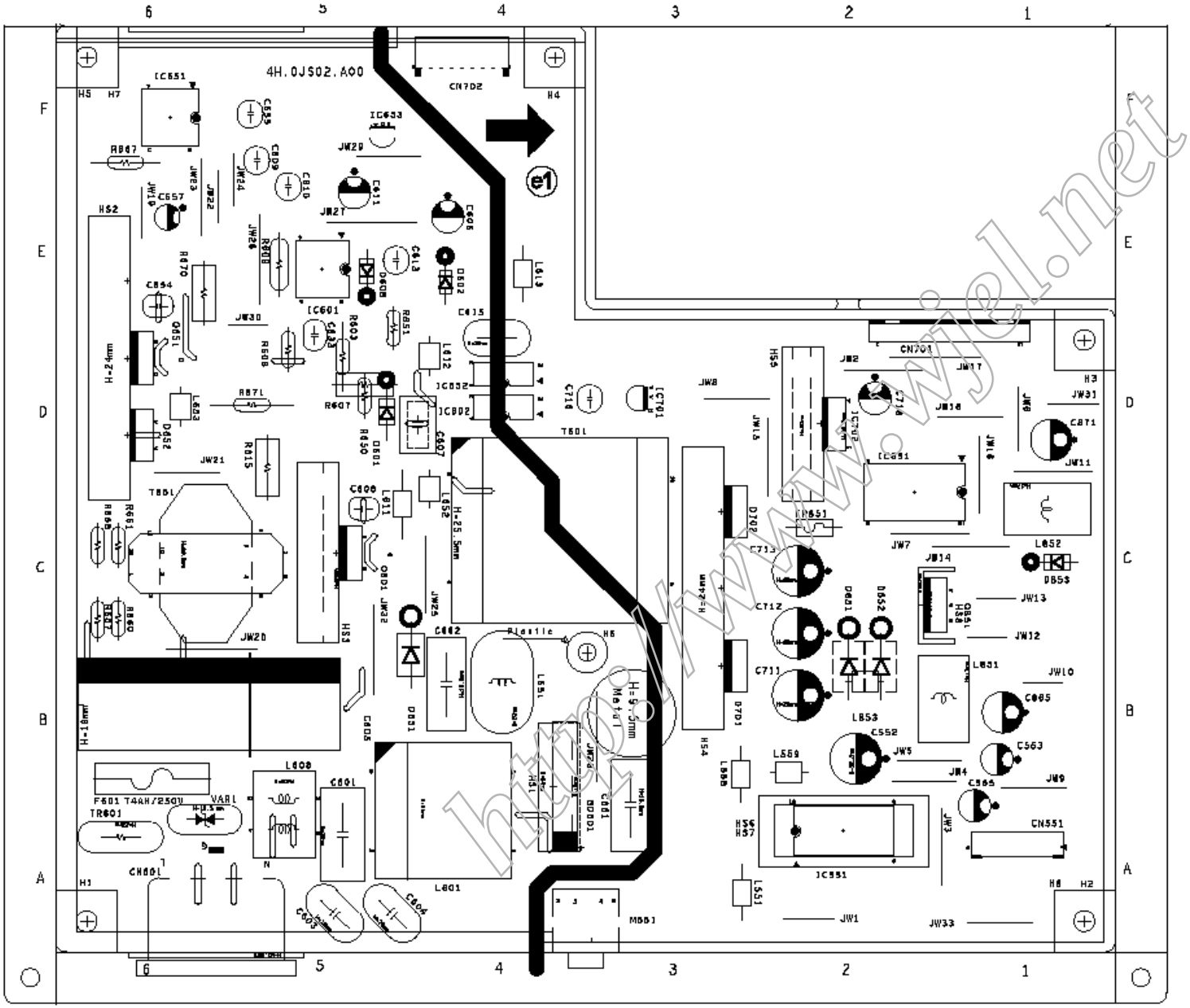
Power Diagram



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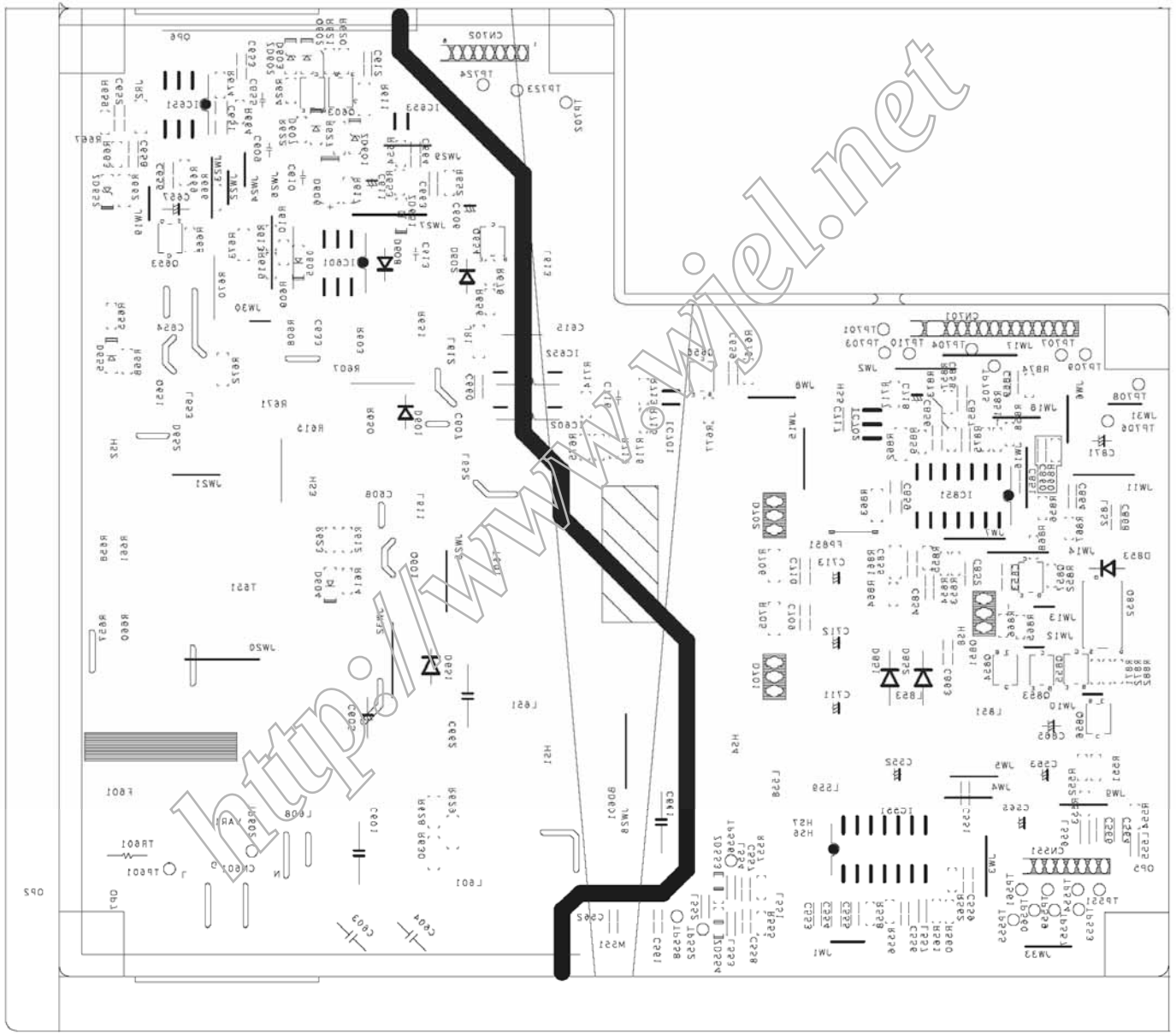
C1:Q851      Informatio
C1:D853      Y1:  1181
C1:JW13      Y2:  2362
C1:JW12      Y3:  3543
C1:L852      Y4:  4724
C2:JW7       Y5:  5905
C2:JW15      X1:  6755
C2:JW14      X2:  5404
C2:IC851     X3:  4053
C2:FP851     X4:  2702
C2:C713      X5:  1351
C2:C712
C3:D702      Top Side
C4:JW25      A1:CN551
C4:T601      A1:JW33
C5:Q601      A1:JW3
C5:LC601     A1:C565
C5:R6658     A2:IC551
C6:JW31      A2:JW1
C6:R6651     A3:M551
C6:R6658     A3:L551
D1:JW6       A3:C661
D1:JW17      A5:L608
D1:JW16      A5:C604
D1:JW11      A6:CN601
D1:C871      A6:VAR1
D2:IC702     A6:TR601
D2:JW8       B1:JW9
D2:JW2       B1:JW4
D2:JW18      B1:JW10
D2:C718      B1:L851
D3:IC701     B1:LC563
D3:C716      B1:C5652
D4:L652      B2:D8551
D4:L6152     B2:D8552
D4:IC6602    B2:C552
D4:IC6607    B2:JW29
D5:C6607     B2:L559
D5:R6651     B3:L853
D5:R6650     B3:JW28
D5:R6608     B3:D7701
D5:R6603     B4:L6551
D5:D6021     B4:D6551
D6:JW6651    B4:C6622
D6:LD6652    B4:BD6601
D6:CN701     B5:L601
E2:L6613     B5:C605
E4:LD6615    B5:JW32
E4:C6606     B5:C601
E5:JW30      B6:JW20
E5:JW27      B6:R6660
E5:JW26      B6:R6657
E5:JW24      B6:F601
E5:R6609     E5:C613
E5:IC601     E5:C610
E5:D608      E6:C611
E5:DC633     E6:JW23
F5:C6655     E6:JW22
F5:C6609     E6:JW19
F6:R6667     E6:R6670
F6:IC651     E6:C6654
             E6:C6657
             F4:CN702
             F5:JW29
             F5:IC653
```

Power Diagram



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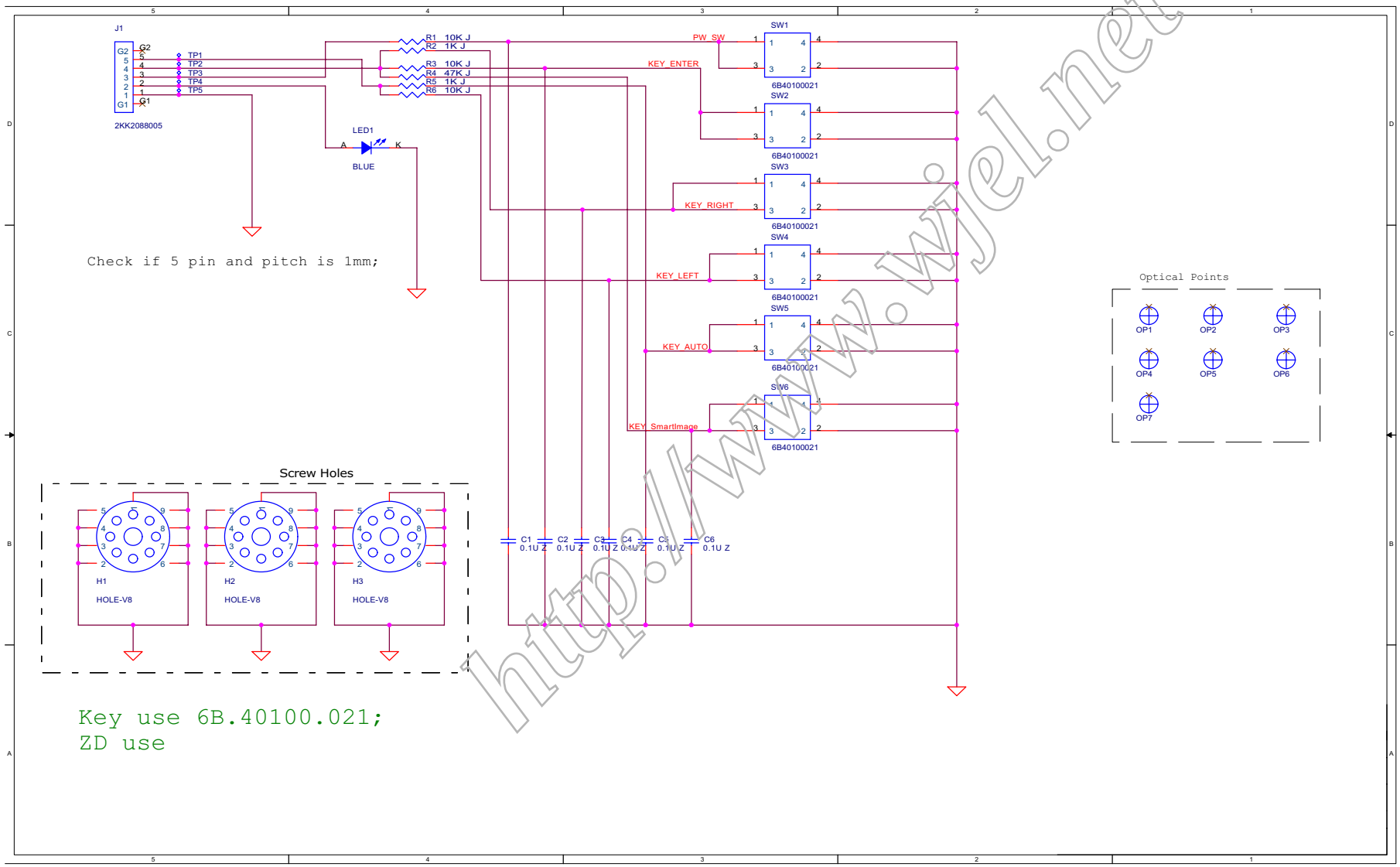
Control Diagram



R1	D4
R3	D4
R6	D4
R2	D4
R5	D4
R4	D4
SW1	D3
SW2	D3
SW3	D3
SW4	C3
SW5	C3
SW6	C3

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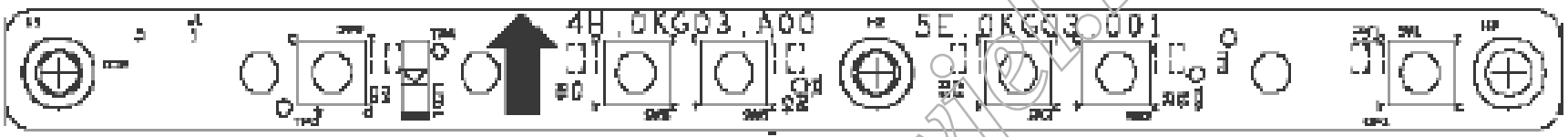
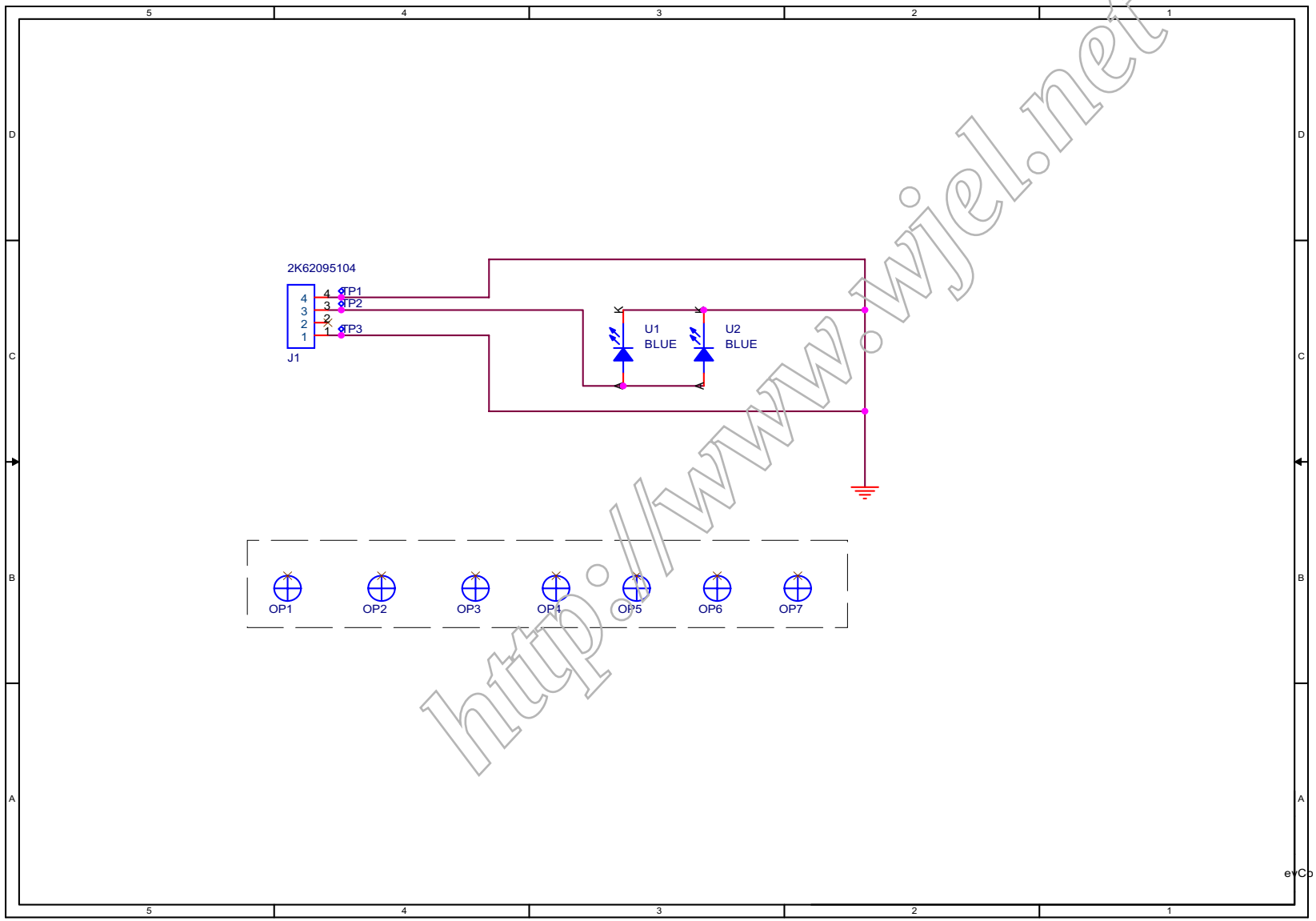
Control Diagram



http://www.wjdl.net

LED Diagram



U1 C3

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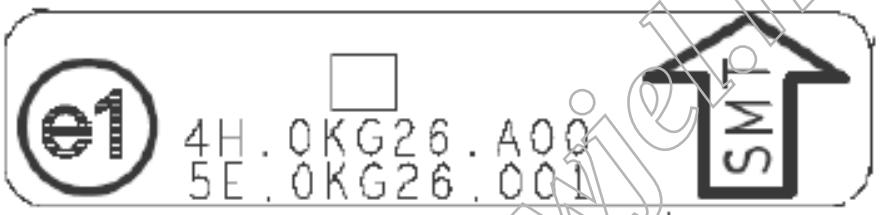
LED Diagram



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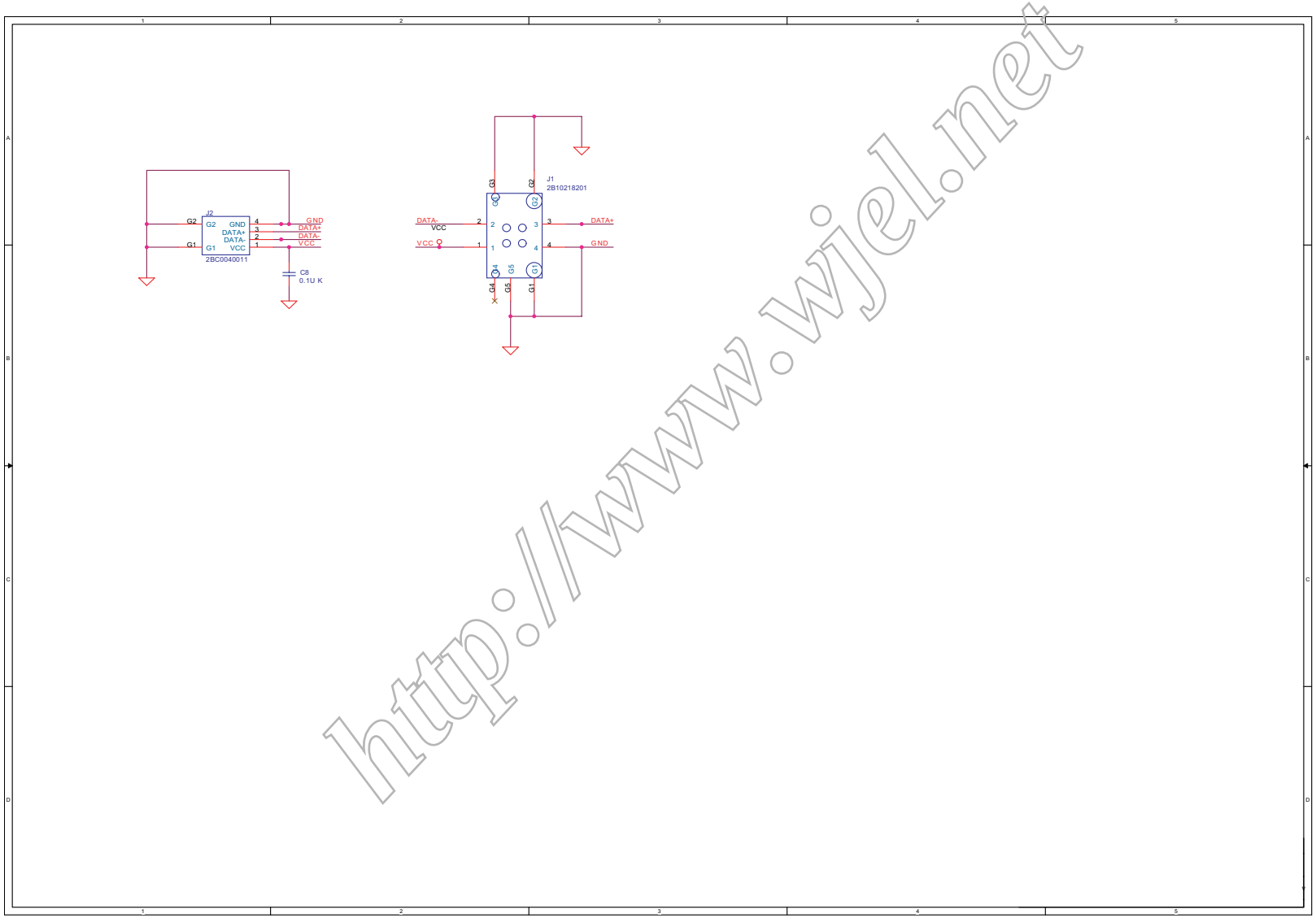
USB Diagram & C.B.A



J2:A1

J1:A2

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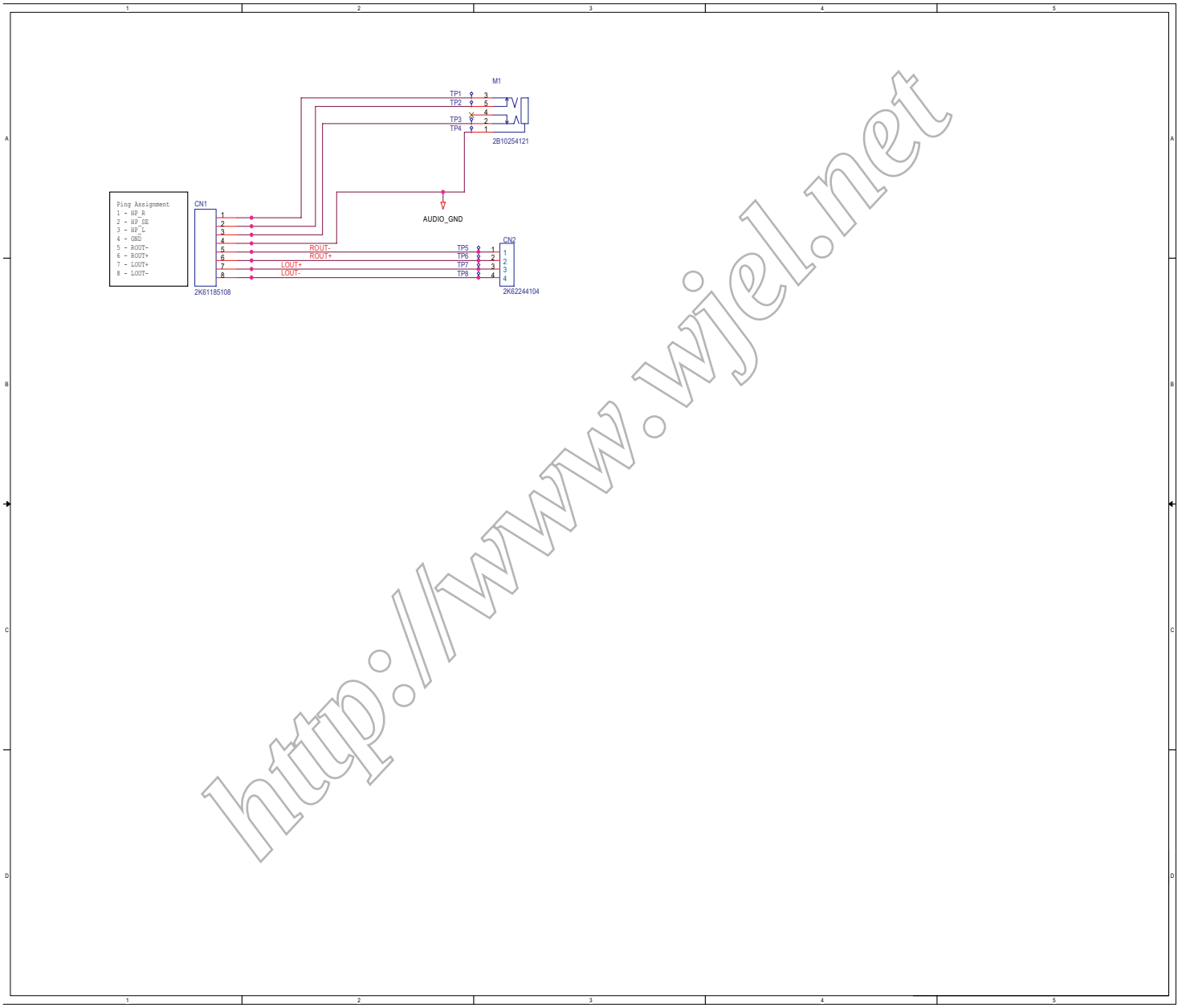
USB Diagram & C.B.A



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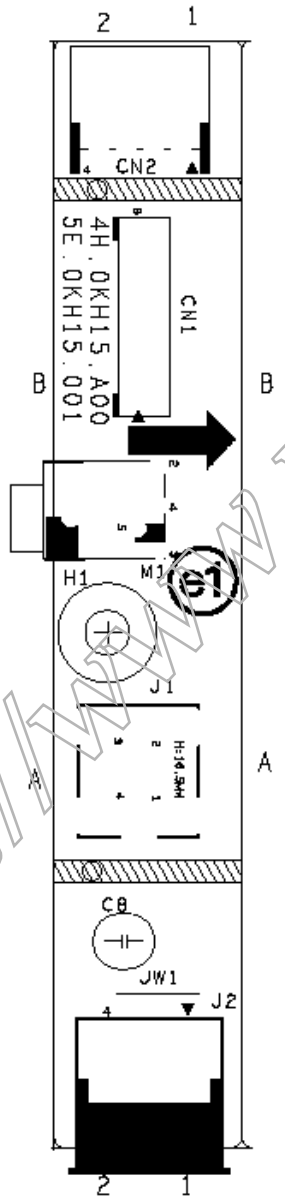
CN1:A1

M1:A3

CN2:B3

USB Diagram



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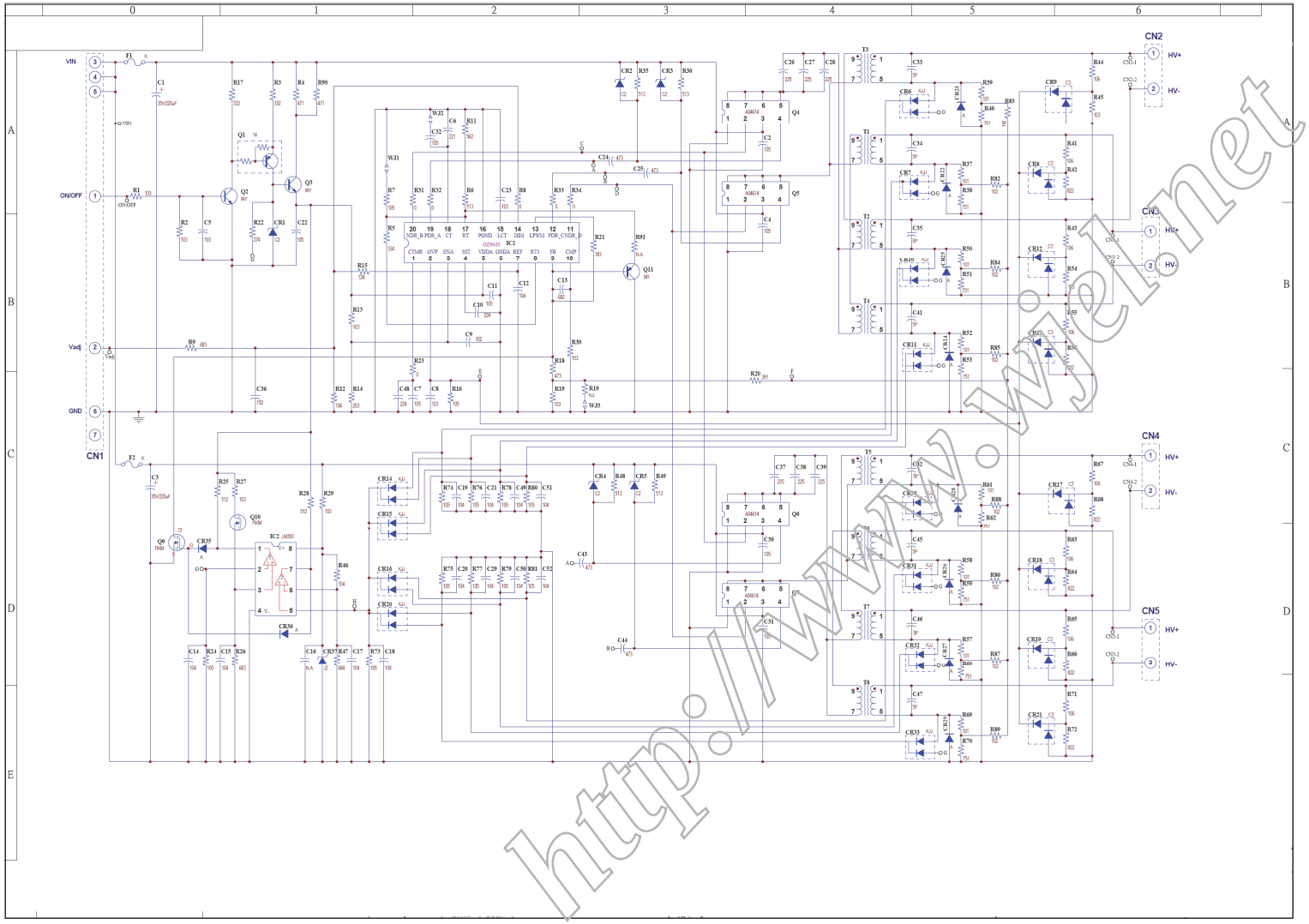
Inverter Diagram



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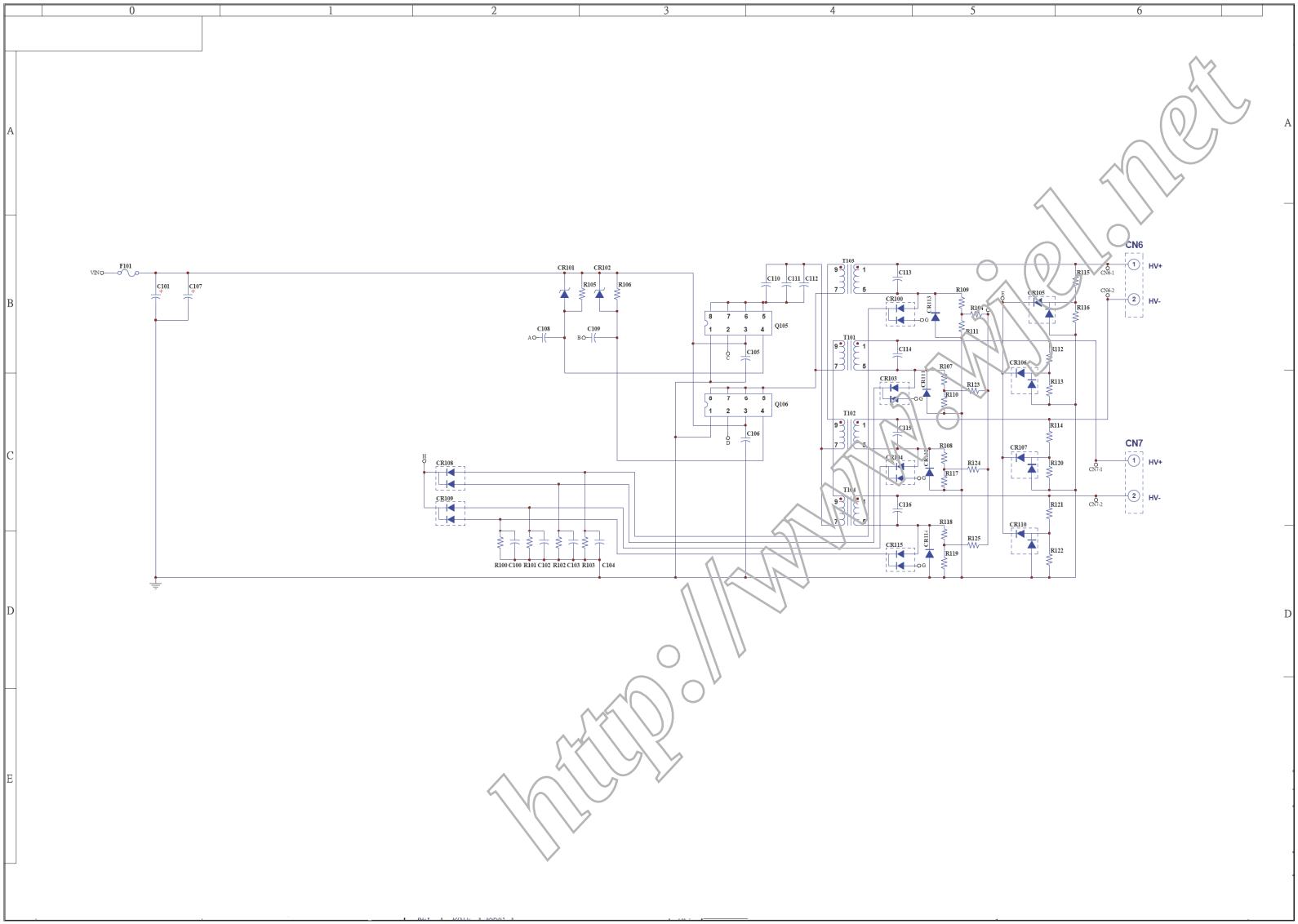
A0:F1
A0:R1
A0:C1
A1:R17
A1:R3
A1:R4
A1:R90
A1:R7
A1:Q1
A1:Q2
A1:Q3
A1:WJ1
A2:R11
A2:R31
A2:R32
A2:R6
A2:R8
A2:R33
A2:R34
A2:C6
A2:C32
A2:WJ2
A3:R35
A3:R36
A3:C24
A3:C25
A3:CR2
A3:CR3
A4:C26
A4:C27
A4:C28
A4:C2
A4:Q4
A4:Q6
A4:T1
A4:T3
A5:C33
A5:C34
A5:CR6
A5:CR7
A5:CR22
A5:CR8
A5:CR9
A5:R37
A5:R38
A5:R39
A5:R40
A5:R82
A5:R83
A6:R44
A6:R45
A6:R41
A6:R42

B0:R2
B0:R9
B0:C5
B1:R22
B1:R5
B1:R15
B1:R13
B1:R23
B1:C22
B1:CR1
B2:R18
B2:R30
B2:C9
B2:C10
B2:C11
B2:C12
B2:C13
B2:IC1
B3:R21
B3:R91
B3:Q11
B4:C4
B4:T2
B4:T4
B5:R50
B5:R51
B5:R52
B5:R53
B5:R84
B5:R85
B5:C35
B5:C41
B5:CR10
B5:CR11
B5:CR12
B5:CR13
B5:CR24
B5:CR25
B6:R43
B6:R54
B6:R55
B6:R56
E5:R69
E5:R70
E5:R89
E5:CR33
E5:CR29
E5:CR21
E6:R71
E6:R72

C0:F2
C0:C3
C1:R25
C1:R27
C1:R28
C1:R29
C1:R12
C1:R14
C1:C36
C1:C48
C1:C7
C1:CR14
C1:CR15
C1:Q10
C2:R16
C2:R19
C2:R74
C2:R76
C2:R78
C2:R80
C2:C8
C2:C19
C2:C21
C2:C49
C2:C51
C3:R10
C3:R48
C3:R49
C3:CR4
C3:CR5
C3:WJ3
C4:C37
C4:C38
C4:C39
C4:Q6
C4:T5
C5:R61
C5:R62
C5:R88
C5:C42
C5:CR30
C5:CR28
C6:R67
C6:R68
C6:CR17

D0:R24
D0:C14
D0:Q9
D0:CR35
D1:R26
D1:R46
D1:R47
D1:R73
D1:C15
D1:C16
D1:C17
D1:C18
D1:CR36
D1:CR37
D1:CR16
D1:CR20
D1:IC2
D2:R75
D2:R77
D2:R79
D2:R81
D2:C20
D2:C29
D2:C50
D2:C52
D2:C43
D3:C44
D4:C30
D4:C31
D4:Q7
D4:T6
D4:T7
D5:R57
D5:R58
D5:R59
D5:R60
D5:R86
D5:R87
D5:C45
D5:CR31
D5:CR32
D5:CR26
D5:CR27
D5:CR18
D5:CR19
D6:R63
D6:R64
D6:R65
D6:R66

Inverter Diagram



B0:C101
B0:C107
B0:F101
B2:C108
B2:CR101
B2:R105
B3:R106
B3:C109
B3:CR102
B4:C105
B4:C110
B4:C111
B4:C112
B4:C113
B4:C114
B4:Q105
B4:T103
B4:T101
B4:CR100
B5:R104
B5:R109
B5:R111
B5:R112
B5:CR113
B5:CR105
B6:R115
B6:R116

C2:CR108
C2:CR109
C4:Q106
C4:C106
C4:C115
C4:C116
C4:T102
C4:T104
C4:CR103
C4:CR104
C5:R107
C5:R110
C5:R123
C5:R108
C5:R117
C5:R124
C5:R113
C5:R114
C5:R120
C5:R121
C5:CR106
C5:CR107
C5:CR111
C5:CR112

D2:R100
D2:R101
D2:R102
D2:R103
D2:C100
D2:C102
D2:C103
D2:C104
D5:R118
D5:R119
D5:R122
D5:R125
D5:CR114
D5:CR115
D5:CR110

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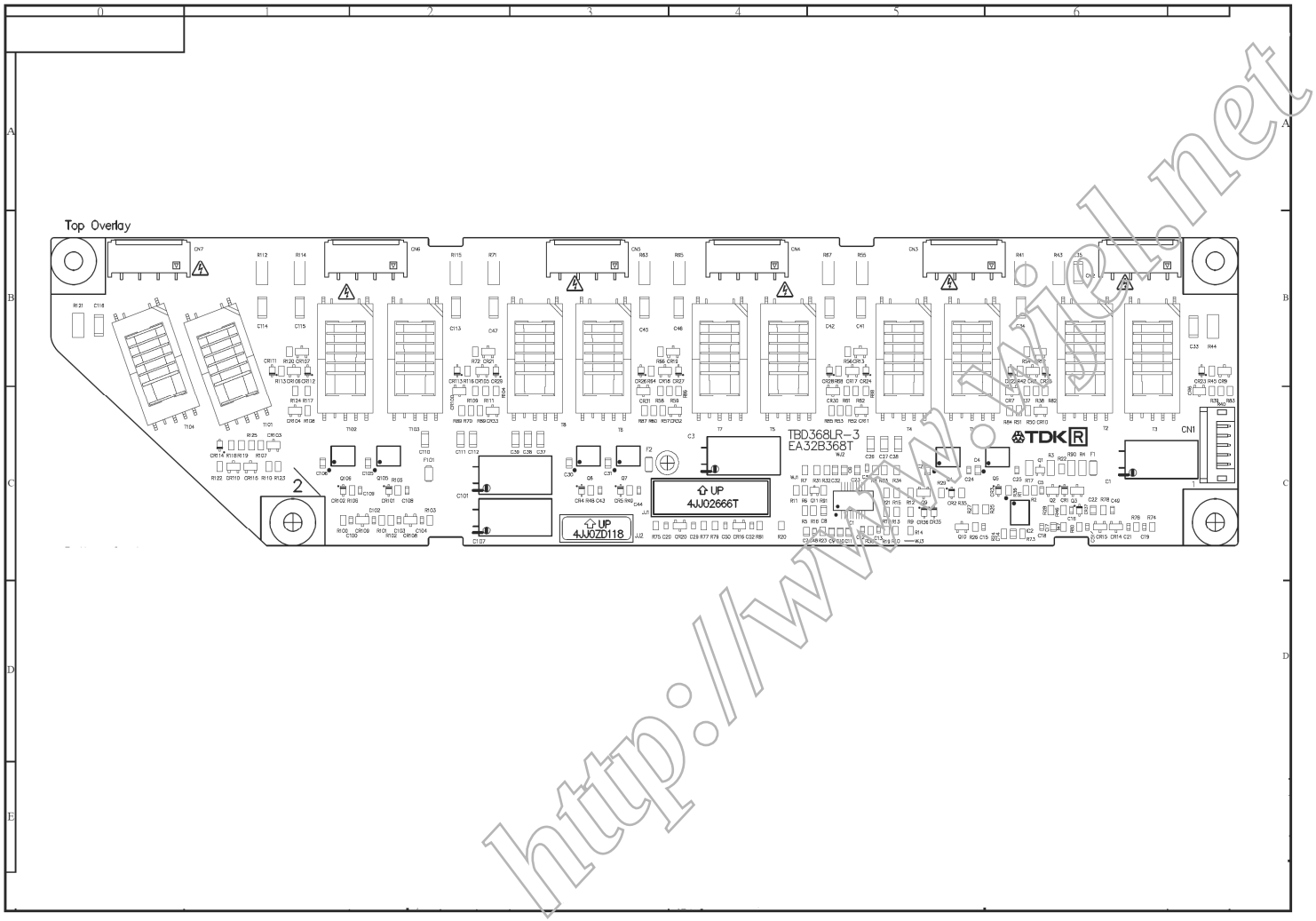
Inverter Diagram



B0:R121
B0:C116
B1:R112
B1:R114
B1:R120
B1:R113
B1:C114
B1:C115
B1:CR111
B1:CR107
B1:CR106
B1:CR112
B2:R115
B2:R71
B2:R72
B2:R116
B2:C113
B2:C47
B2:CR21
B2:CR113
B2:CR105
B2:CR29
B3:R63
B3:R66
B3:R64
B3:R65
B3:C45
B3:CR19
B3:CR18
B3:CR26
B4:R65
B4:C46
B4:CR27
B5:R67
B5:R55
B5:R56
B5:R68
B5:C41
B5:C42
B5:CR13
B5:CR28
B5:CR17
B5:CR24
B6:R41
B6:R43
B6:R54
B6:R42
B6:R44
B6:R45
B6:C34
B6:C33
B6:C35
B6:CR22
B6:CR8
B6:CR25
B6:CR12
B6:CR23
B6:CR9

C1:R124
C1:R117
C1:R108
C1:R125
C1:R118
C1:R119
C1:R107
C1:R112
C1:R110
C1:R123
C1:R100
C1:C106
C1:CR104
C1:CR103
C1:CR114
C1:CR110
C1:CR115
C1:CR102
C1:Q106
C1:T104
C1:T101
C2:R109
C2:R111
C2:R104
C2:R89
C2:R70
C2:R69
C2:R105
C2:R106
C2:R103
C2:R101
C2:R102
C2:Q105
C2:F101
C2:CR100
C2:CR33
C2:CR101
C2:CR109
C2:CR108
C2:C110
C2:C111
C2:C112
C2:C105
C2:C109
C2:C108
C2:C102
C2:C101
C2:C107
C2:C100
C2:C103
C2:C104
C2:T102
C2:T103
C5:IC1
C5:WJ2
C5:WJ3
C5:Q4
C5:Q11

C3:R58
C3:R87
C3:R60
C3:R57
C3:R48
C3:R49
C3:R75
C3:C39
C3:C38
C3:C37
C3:C30
C3:C31
C3:C43
C3:C44
C3:C20
C3:CR31
C3:CR4
C3:CR5
C3:T6
C3:T8
C3:F2
C3:Q6
C3:Q7
C4:R59
C4:R86
C4:R7
C4:R11
C4:R6
C4:R5
C4:R77
C4:R79
C4:R81
C4:R20
C4:C3
C4:C29
C4:C50
C4:C52
C4:C7
C4:T7
C4:T5
C4:CR20
C4:CR16
C4:WJ1
C5:Q9
C5:Q10

C5:R61
C5:R62
C5:R88
C5:R85
C5:R53
C5:R52
C5:R31
C5:R32
C5:R8
C5:R33
C5:R34
C5:R29
C5:R91
C5:R21
C5:R15
C5:R12
C5:R35
C5:R27
C5:R16
C5:R18
C5:R13
C5:R9
C5:R23
C5:R30
C5:R19
C5:R10
C5:R14
C5:R26
C5:C26
C5:C27
C5:C28
C5:C6
C5:C2
C5:C4
C5:C32
C5:C23
C5:C36
C5:C24
C5:C8
C5:C9
C5:C10
C5:C11
C5:C48
C5:C12
C5:C13
C5:C15
C5:T1
C5:T4
C5:CR30
C5:CR11
C5:CR2
C5:CR36
C5;CR35

C6:R37
C6:R38
C6:R82
C6:R39
C6:R40
C6:R83
C6:R84
C6:R51
C6:R50
C6:R3
C6:R22
C6:R90
C6:R4
C6:R17
C6:R36
C6:R1
C6:R2
C6:R78
C6:R25
C6:R28
C6:R46
C6:R76
C6:R74
C6:R24
C6:R73
C6:R47
C6:R80
C6:F1
C6:C25
C6:C5
C6:C1
C6:C22
C6:C49
C6:C16
C6:C17
C6:C14
C6:C18
C6:C51
C6:C21
C6:C19
C6:T2
C6:T3
C6:CR7
C6:CR6
C6:CR3
C6:CR1
C6:CR37
C6;CR15
C6:CR14
C6:CR10
C6:Q5
C6:Q1
C6:Q2
C6:Q3
C6:IC1

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General Product Specification

HUDSON 9- 240BW9
GENERAL PRODUCT
SPECIFICATION

Issued by: Mark Chan/Argent Chan

Revision History

Ver.	Date (yy.mm.dd)	Author	Brief Description
0.1	2008-05-08	Mark Chan	Initial version
0.3	2008 Jul 18	Argent	Updated ME reguest.

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General Product Specification

. DSUB x 1 + DVI-D x1 INPUTS

. AUTO PICTURE ADJUSTMENT

. 15 (1920x1200 193MHz should be able to display in VGA) FACTORY PRESET MODES AND 53 PRESET MODES WHICH CAN BE RECOVERED TO PRESET MODES, 16 USER MODES

. USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION /ADJUSTMENT

. MAX. RESOLUTION 1920 x 1200 NON-INTERLACED AT 60 HZ

. 24”W 1920x1200 16:10 COLOR TFT LCD FLAT PANEL

. FULL RANGE POWER SUPPLY 90 – 264 VAC/50&60Hz

. CE ENVIRONMENTAL POLICY

. ANTI-GLARE TO REDUCE LIGHT REFLECTION

. POWER MANAGEMENT CAPABILITY

. SOG SUPPORT

. TCO’03 for WW models / non-TCO for China model. (Waitting for supplier input)

. AUDIO SUPPORT

.Windows Vista Premium Logo Certification

.HDCP support for DVI inputs

.POWER ON PHILIPS LOGO REQUIREMENT

.WEEE REQUIREMENT

.RoHS REQUIREMENT

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General Product Specification

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General Product Specification

1 FOREWORD

This specification describes a 24"W WUXGA multi-scan color TFT LCD monitor with maximum resolution up to 1920 x 1200 /60 Hz non-interlaced.
All optical characteristics (including WHITE-D, Brightness, and so on) are determined according to panel specification after warming up approximate 30 minutes that brightness stability is optimal, and follow strictly after panel specification.

2 PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in PHILIPS styling cabinet which has an integrated tilt / high adjustment base.

2.1 LCD

Type: TN
Suppliers to offer the panel specification.
Panel incoming specification: Follow Philips' specification.

SEC

Type NR.	: SEC LTM240CT03
Resolution	: 1920x1200 (WUXGA)
Outside dimensions	: 546.4 (H) x 352 (V) x 36.3 (D)
Pitch (mm)	: 0.27
Color pixel arrangement	: RGB vertical stripes
Display surface	: Haze 25% , Hard-coating(3H)
Color depth	: 16.7 M colors
Backlight	: U-type 6 CCFTs
Active area(WxH)	: 518.4(H) x 324(V)
View angle (CR>10)	: 160/160 (typ) for H/V
Contrast ratio	: 1000:1 (typ)
White luminance	: 400 (typ)
Color gamut	: 92%
Gate IC	: LDI
Source IC	: LDI
Response time	: 5 ms(typ)

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2.2 Scanning frequencies

Hor.: 24 – 94 K Hz
Ver.: 48 - 85 Hz
Video dot rate: 210MHz for VGA and 170 for DVI
Power input: 90-264 V AC, 50/60 ± 2 Hz
Power consumption: < 85 W / after 30 mins, meet EPA tier 2 requirement

Functions:
(1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V)

General Product Specification

TTL level, SOG sync
(2) DVI digital Panel Link TMDS inputs

2.3 Ambient temperature: 0 °C - 40°C

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General Product Specification

3 Electrical characteristics

3.1 Interface signals

1). D-Sub Analog

Input signal : Video, Hsync., Vsync

Video : 0.7 Vp-p, input impedance, 75 ohm @DC

Sync. : Separate sync TTL level , input impedance 2.2k ohm terminate
Hsync Positive/Negative
Vsync Positive/Negative
Composite sync TTL level, input impedance 2.2k ohm terminate
(Positive/Negative)
Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

2). DVI-D Digital
Input signal: Single TMDS link (Three channels: RX0-/+, RX1-/+, RX2-/+)

3). Audio
Input signal: 800 mVrms
Loudspeaker (Impedance: 5.3 Ohm +/-15%): 1.5W+ 1.5W stereo for RMS Power
Frequency range: 650Hz - 20KHz
Headphone connection will mute speakers

4). USB PLUG 2.0 (Not required in 240BW8)
Input signal: Upstream input (V_{BUS}, D+, D-, GND) via USB-B receptacle.

Output signal: Downstream output (V_{BUS}, D+, D-, GND) through USB-A receptacle

3.2 Interface

3.2.1 D-Sub Cable

Length : 1.8 M +/- 50 mm
Connector type : D-Sub male with DDC2B pin assignments.
Blue connector thumb-operated jack screws

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pin assignment :

PIN No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

3.2.2 DVI Cable

The input signals are applied to the display through DVI-D cable.
Length. : 1.8 M +/- 50 mm
Connector type. : DVI-D male with DDC-2B pin assignments
White connector thumb-operated jackscrews

Pin Assignment:

Pin No.	Description
1	T.M.D.S. data2-
2	T.M.D.S. data2+
3	T.M.D.S. data2 shield
4	No Connect
5	No Connect
6	DDC clock
7	DDC data
8	No Connect
9	T.M.D.S. data1-
10	T.M.D.S. data1+
11	T.M.D.S. data1 shield
12	No Connect
13	No Connect
14	+5V Power
15	Ground (for +5V) – Cable detect
16	Hot plug detect
17	T.M.D.S. data0-
18	T.M.D.S. data0+
19	T.M.D.S. data0 shield
20	No Connect

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General Product Specification

21	No Connect
22	T.M.D.S clock shield
23	T.M.D.S. clock+
24	T.M.D.S. clock-

3.2.3 Audio Cable

Length : 1.8 M +/- 50 mm
Connector type : 3.5-mini jack with Lemon green color on the both end heads.
Sliver & Black model: Black cable.
T color model: white cable.

3.3 Timing requirement

Factory Preset mode definition :

1. Perfect FOS (except PHASE) while presenting all required timings.
2. Required timings need to be specified in User's Manual

Preset mode definition :

1. Need to support those timings.
2. Perfect FOS after auto adjustment.

User mode

1. Can save those timing that not in Preset mode and can be showed (not over scalar or Panel spec.)
2. It needs to reserve the 10 timings space in memory size.

3.3.1 Mode storing capacity

Factory preset modes : 15
Preset modes : 53
User define modes : 16 (waiting for supplier input)

Note:
1. Screen displays perfect picture at 15 factory-preset modes.
2. Screen displays visible picture with OSD warning when input modes are the 51 preset modes

3.2.5 Factory preset modes (15 modes)

Factory modes and preset modes are defined in the enclosed timing table file

H9 Timing table_200800401.xls

- Video timing mode (internal firmware support) ,
  60Hz: 480p/720p/1080i/1080p
  50Hz: 576p/720p/1080i/1080p

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3.3 OSD behavior

Please refer to following Hudson9 OSD definitions, if any deviation, then refer to PVT Exit sample.

ITEM			
1	OSD DEFINITIONS	Hudson 8 OSD Definition - v14.doc	Reset - No: Exit Yes: Auto adjustment for displaying timing mode and recall factory preset
2	OSD LANGUAGES	H9 OSD translation - 20080516 - Final.xls	8 LANGUAGES
3	OSD TREE	Button definition _ 20080619.xls	
4	POWER ON LOGO	24W_1920x1200_new.zip	Power On Logo: Power On → Show up Philips logo 3 seconds → Change to input signal. This picture is reference only. The official drawing will send out by PM.
5	Audio Selection	Stand-alone – On: Isolate video and audio control input Stand-alone – Off: Integrate video and audio control input Mute – On: Turn off audio Mute – Off: Turn on audio	

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3.4 Horizontal scanning

Sync polarity : Positive or Negative
Scanning frequency : **24 – 94 K Hz**

3.5 Vertical scanning

Sync polarity : Positive or Negative
Scanning frequency : **48 - 85Hz**

General Product Specification

3.6 Power input connection

Power cord length : 1.8 M
Power cord type : 3 leads power cord with protective earth plug.

3.7 Power management

The monitor must comply with the Microsoft On Now specification, and meet EPA requirements.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	85W typical (After 30 mins)	Blue LED	--
Off	Off	Off	blanked	< 1 W (<110V & no audio) < 2 W (<220V & no audio)	Blue LED Blinking 3 sec on, 3sec off	< 3 s
DC Power Off			N/A	< 1 W	LED Off	

3.8 Analog Display identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

3.9 DVI- D Display identification

In accordance with DVI requirement (DDWG digital Visual Interface revision 1.0) use DDC-2B, DDC/CI, and EDID V1.3

3.10 USB Plug support

Connect the upstream port of the monitor to host PC's USB port via USB cable, Then attach external device to the downstream port of the monitor.
Check if the device can work properly.

3.11 DDC /CI Support

In accordance with VESA DDC/CI and MCCS ver.2.0, the monitor should be workable with Protrait Display Tune at least.

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3.12 EDID

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 240BW (24inch Wide LCD MONITOR 240BW9)
2	Manufacturer ID (EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): 08
		LSB (byte 11): 72
4	maximum resolution	1920x1200
5	Horizontal Frequency Range	24~94 KHz
6	Vertical Frequency Range	48~85Hz
7	Monitor Name (13 characteries max.)	Philips 240BW

3.13 Hot-key definition

Any deviation, then refer to PVT Exit sample.

3.14 Smart Bright --Dynamic Brightness Control (DBC) (Not required for 240BW8)

DCR controlled by Scaler

DCR function ON , contrast ≧ 2X original contrast specification.

3.15 Smart contrast (Dynamic contrast ratio)

Smart Contrast is a kind of dynamic backlight control.

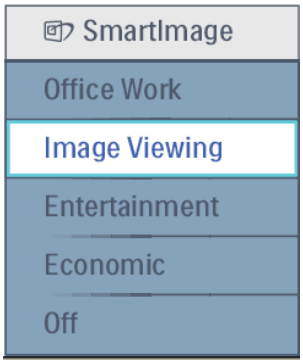
This function changes

the panel backlight dynamically according to the frame brightness histogram.

The contrast ratio is **10000:1 (typical)**. (if require panel spec 1000:1)

3.16 Smart image (Not required for 240BW8)

3.16.1 Smart Image OSD outlook



3.16.1.1 Position

Pressing the “Smart Image” button, the position is in the bottom center of the screen.

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3.16.1.2 Smart Image Logo & Banner

As design to keep the LightFrame logo at header but change the name to "SmartImage" with bitmap format.

3.16.1.3 Icon of each profile

Each profile will use text instead of icon & text before, refer to 240BW8 MS&GS.

3.16.1.4 User Operation Procedure

A. 5 different modes are switched to next in the sequence from 1 to 5 then back to 1 while pressing this button: 1) Office Work 2) Image Viewing 3) Entertainment 4) ~~Economic~~ Economy 5) Off. The default setting is 'Off".
B. The FOS optimization will be changed in real time by which profile to be scrolled, users don't need to confirm to enable.
C. The Smart Image OSD will remain on screen for 5 seconds after user last action. Or user can also press [MENU] to close the Smart Image OSD immediately.
D. Except using [MENU] button to scroll down profile. If Smart Image OSD already launched onscreen. User is allowed to use up/down key to choose profile and press [MENU] to confirm selection and close the Smart Image OSD.
E. If the model has multiple inputs including VGA and DVI, each input has their own set of profiles. When user switch input, the profile to be applied will also change.
F. Each input can memorize their individual "Smart Image" profile status.

For example, Smart Image is on with "Office" profile at VGA input, when switch to DVI input, the Smart Image will revert to previous profile of DVI.
In the input switching process the "Smart Image" OSD will also show up to present which profile is selected if "Smart Image" is enabled at that input.

The Smart Image status will also be stored after the monitor is resumed from AC on/off or power switch on/off.

3.16.1.5 Linkage between Smart Image OSD and main OSD

A. Settings within main OSD have linkage with Smart Image OSD.
   i. Brightness

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ii. Contrast

iii. Color Temperature

B. Because each preset profiles will define default setting of these 3 parameters. Users can understand what is the value of that in preset profile by open the main OSD.

C. When any SmartImage Lite profile had been enabled. The parameters in main OSD are still available for user to adjust. But these adjustments are temporary only. If users switch to another profile and then go back. The setting in main OSD will show preset values of that SmartImage profile enabled.

3.16.1.6 Profile Definitions (system integrators to input at design stages)

A. Office Work

i. Purpose: Design for general office application, like word processing, Spreadsheet and email. The screen is dominated by text.

ii. Enhancement point:

1. A little sharpness for increasing the details of e.g. an excel grid. No other type of enhancement as it won't bring value.
2. Color temperature remains in 6500°K.
3. Brightness level should be 70%.
4. Smart Response set to “Off”.
5. Smart Contrast set to “Off”.

B. Entertainment

i. Purpose: Design for video application, Like Microsoft Media Player or Real Player. The screen is dominated by video.

ii. Enhancement Point:

1. Dynamic contrast enhancement by histogram analysis (DLC) should be implemented.
2. Sharpness enhanced 90%.
3. Color enhancement set as the same with Video.
4. Color temperature set to 7500° (**Based on final PQ settings**) (if higher)
5. Brightness level sets to maximum.
6. SmartResponse set to “High”.(N/A for this model)
7. Gamma Table turn off to achieve

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8. Fastest response time. (N/A for this model)
9. Smart Contrast set to “On”

C. Image Viewing

i. Purpose: Design for image viewing application, especially in slide show. The screen is dominated by picture. Powerpoint presentation could use this profile also.

ii. Enhancement Point:

1. Dynamic contrast enhancement by histogram analysis (DLC) should be off.
2. Sharpness and color to be enhanced 75%.
3. Color temperature 6500°K
4. Brightness level sets to maximum.
5. Smart Response set to “Off”. (N/A for this model)
6. Smart Contrast set to “Off”.

D. Economy

i. Purpose: Adjust brightness level for reducing power consumptions

ii. No optimization by Smart Image.

iii. Design:

1. Brightness level set to 70%, a little higher brightness level than laptop PC, fine tune brightness level before DVT exit.
2. Color temperature set to 6500K.
3. Gamma Table is turn on.

E. Off

i. Purpose: No optimization by SmartImage.

ii. Design:

1. This will follow user OSD setting. If any change by user, it will be saved. When switch back from other SmartImage profiles, it will go back to last saved setting.
2. Gamma Table is turn on to reduce bad color tracking.

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3.16.1.7 Demo mode

A. Purpose: Built-in demo mode for sales in-store demo.

B. Design:

i. Dynamically split screen to 2 vertical frames with one vertical white line. The line width is 2 pixels. The left frame will be enhanced by SmartImage and right frame remains original performance.

ii. There is OSD showing “SmartImage On” in left frame and “SmartImage Off ” in right frame.

iii. The OSD word color is white with transparent background.

C. The demo profile will be “entertainment profile setting.

D. Hot keys to trigger:

Press [SmartImage] 3 seconds or more to trigger the demo mode.

When demo mode is On, press 3 seconds or more to turn off the demo mode.

When the demo mode is enabled, the blue LED will flash until demo mode disabled.(N/A for this model)

3.17 Smart Response (Not required for 240BW8)

Gray to Gray Response time : ?ms (max.)

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4 Visual characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

(1) Input signal : As defined in , 1920 x 1200 non-interlaced mode ~~(1920 x 1200@75Hz)~~ (1920 x 1200@60Hz), signal sources must have 75 ohm output impedance.

(2) Luminance setting : controls to be set to ~~300 nits (typical)~~ 250 nits (typical) with full screen 100 % duty cycle white signal

(3) Warm up: more than 30 minutes after power on with signal supplied.

(4) Ambient light: 400 -- 600 lux.

(5) Ambient temperature: 20 ± 5 °C

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4.2 Brightness

To follow Panel specification.

4.3 Image size

Actual display size 518.4 x 324 mm

4.4 Brightness uniformity

Set contrast at 100% and turn the brightness at 100%.

Apply the Fig 1, it should comply with the following formula:

$$\frac{B_min}{B_max} \times 100\% > 75\%$$

Where B_max =Maximum brightness
B_min = Minimum brightness

4.5 Check Cross talk (S)

Apply Pattern 2. Set contrast and brightness at 100 %.
Measure YA. Then output Pattern 3 and measure YB.
the cross talk value :

$$\frac{ABS(YA - YB)}{YA} \times 100\% < 1.5\ \%$$

4.6 White color adjustment

There are three factory preset white color 9300K, 6500K, sRGB

Apply full gray64 pattern, with brightness in 100 % position and the contrast control at 50 % position.
The 1931 CIE Chromaticity (color triangle) diagram (x ,y) coordinate for the screen center should be:
There are three factory preset white color 9300K, 6500K, sRGB.

Apply full white pattern, with brightness in 100 % position and the contrast control at 50 % position.
The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

Product spec.

9300K CIE coordinates	X = 0.283 ± 0.02
	Y = 0.297 ± 0.02

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6500K/ sRGB CIE coordinates	X = 0.313 ± 0.02 Y = 0.329 ± 0.02
sRGB CIE coordinates	X = 0.313 ± 0.02 Y = 0.329 ± 0.02

Production alignment spec.

9300K CIE coordinates	X = 0.283 ± 0.006 Y = 0.297 ± 0.006
6500K/ sRGB CIE coordinates	X = 0.313 ± 0.006 Y = 0.329 ± 0.006
sRGB CIE coordinates	X = 0.313 ± 0.006 Y = 0.329 ± 0.006

Quality Inspection spec.

9300K CIE coordinates	X = 0.283 ± 0.015 Y = 0.297 ± 0.015
6500K/ sRGB CIE coordinates	X = 0.313 ± 0.015 Y = 0.329 ± 0.015
sRGB CIE coordinates	X = 0.313 ± 0.015 Y = 0.329 ± 0.015

5 Mechanical characteristics

5.1 Cosmetic -
Philips ID

5.2 Mechanical data files -
ProE files required

5.3 Location of Philips logo -
Per Philips make-up sheet

5.4 Gap between panel and front bezel
< 1.4mm (Typ.)

5.5 Location of Control icons -
Per Philips Graphic sheet

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5.6 Color for resin/paint –

Per Philips make-up sheet

5.7 Fire enclosure request -

Shielding Cover should fulfill international standard

5.8 Resins

- RoHS required
- WEEE required.
- Resin type/selection refer to Project Book Section 7.2 Plastic material.

5.9 If paint is used

- RoHS required
- WEEE require
- If new painting type need to implement, refer to UN-D 1235.

5.10 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to "TYV61-90007".
- Painting to cover up cosmetic defects due to molding is strongly discouraged.
- China RoHS mark requested.

5.11 Plastics flammability

- All Plastics to be Flame Retardant UL 94-HB or Better.
- Base / Pedestal to be Flame Retardant UL 94-HB.
- All major plastic parts (bezel, back cover) need to be molded from same resin.
- Plastic resin type selection should be referred to "plastic-Philips Pool monitor".

5.12 Texture/Glossing of housing

- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.

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- Detail document for texture refer to “UN-D249”, “UN-D 600”.
- < = 20 gloss units

5.13 Tilt and swivel base

- Tilt angle : -5 ° +2/- 0 ° (forward)
  +20 °+ 0/- 3 ° (backward)
- Swivel angle : ±45 °
- High Adjustment : 70mm
- Portrait Display : nil

5.14 Kennsington Lock

- Must meet Kensington_slot.spec “TYE-M0004”.
- MMD request metal plate in Kinsington hole.

5.15 Label

- Regulatory label / Carton label should follow Philips requirement.
- China RoHS label
- Detail document refer to Philips Engineering Reference Book.

5.16 Product dimension / Weight (Refer to Philips approved SHT 191/SHT560)

- Unit dimension : 558.6 x 494.31 x 220 mm
- Packed unit dimension: 638*563*195 mm
- Net weight : 6.384 Kg
- Gross weight : 8 Kg

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5.17 Transportation

Transportation standards refer to UAN-D1534/00/01/02.

5.17.1 Transportation packages

- Net weight Packaging and wrapping shall be sufficient to protect the product

against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per UAN-D1534/00/01/02.

- The cushion material shall be constructed using EPS material.
- The doggy hole is requested.

5.17.2 Transportation Test

Overall tests refer to UAN-D1534/00/01/02.

Vibration, drop test should be performed at ambient temperature (20℃ to 23°C) and relative humidity (40% to 65%).

A. Transportation test specification for all regions

- Package test
  1. Random Vibration test
  2. Drop test
  3. Cold Drop test (for design reference)
- Un-package test
  1. Half sine shock test (non operation)

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5.18 Pallet / Container loading (Refer to Philips approved SHT 560)

Transportation standards refer to TYE-M0002 ,UAN-D1534 and UAW-0309.

- Air shipment -
- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 45‘ Truck and Trailer (800X1200mm pallet)
- Land 45‘ Truck and Trailer (1000X1200mm pallet) for UK
- Truck shipment-

Transportation request for all regions except China/India

A. Air shipment

B. 20’/40’/40’HQ Container loading for WW

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Transportation request for China and India

A. Container loading for China and India

B. Truck loading

Transportation request for EU

A. Land 45‘ Truck and Trailer (800X1200mm pallet)

B. Land 45‘ Truck and Trailer (1000X1200mm pallet) for UK

6 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

6.1 Susceptibility of display to external environment

Operating

- Temperature : 0 to 40 degree C
- Humidity : 80% max
- Altitude : 0-3658m
- Air pressure : 600-1100 mBAR

Storage

- Temperature : -20 to 60 degree C
- Humidity : 95% max
- Altitude : 0-12192m
- Air pressure : 300-1100 mBAR

Note: recommend at 5 to 35°C, Humidity less than 60 %

6.2 Transportation tests

Refer to 5.15.2

6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

6.4 Display disturbances to external environment

7 Reliability

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7.1 Mean Time Between Failures

System MTBF (Including the LCD panel and CCFL) : 50,000 hrs

8 Quality assurance requirements

8.1 Acceptance test

According to MIL-STD-1916D Control III level

AQL: NA

(Please also refer to annual quality agreement)
Customer acceptance criteria: UAW0377/00

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General Product Specification

9 Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

BRIGHT DOT DEFECTS	**ACCEPTABLE LEVEL**		
MODEL	**240BW9**		
1 lit sub-pixel	3		
2 adjacent lit sub-pixels	0		
3 adjacent lit sub-pixels (one white pixel)	0		
Distance between two bright dots	15mm		
Bright dot defects within 20 mm circle	0		
Total bright dot defects of all type	3		

BLACK DOT DEFECTS	**ACCEPTABLE LEVEL**		
MODEL	**240BW9**		
1 dark sub-pixel	5		
2 adjacent dark sub-pixels	2		
3 adjacent dark sub-pixels (one white pixel)	1		
Distance between two black dots	15mm		
Black dot defects within 20 mm circle*	1		
Total black dot defects of all type	5		

TOTAL DOT DEFECTS	**ACCEPTABLE LEVEL**		
MODEL	**240BW9**		
Total bright or black dot defects of all type	5		

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General Product Specification

Fig 1: Measurement locations of Brightness Uniformity

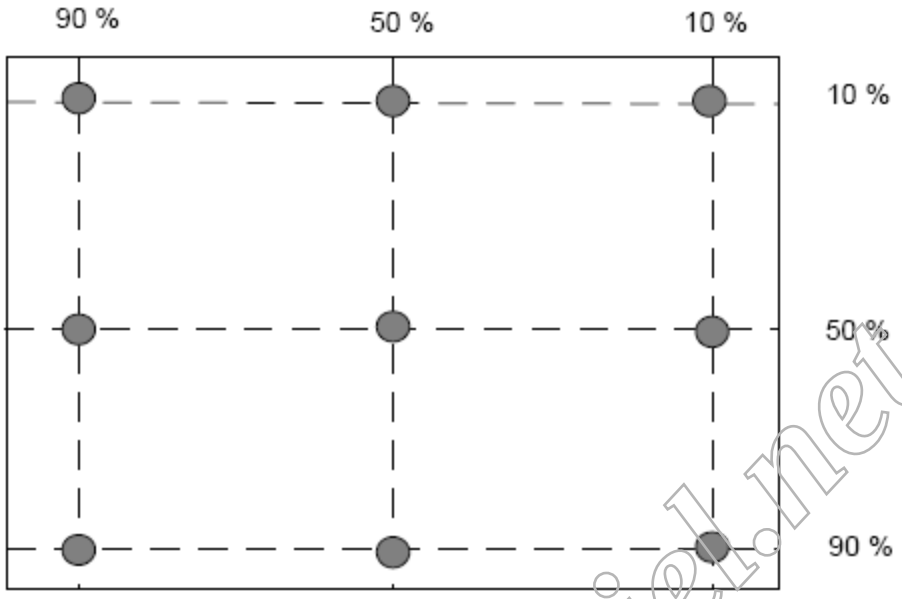

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Fig 2: Cross talk pattern
Gray level 46 (64 Gray level)

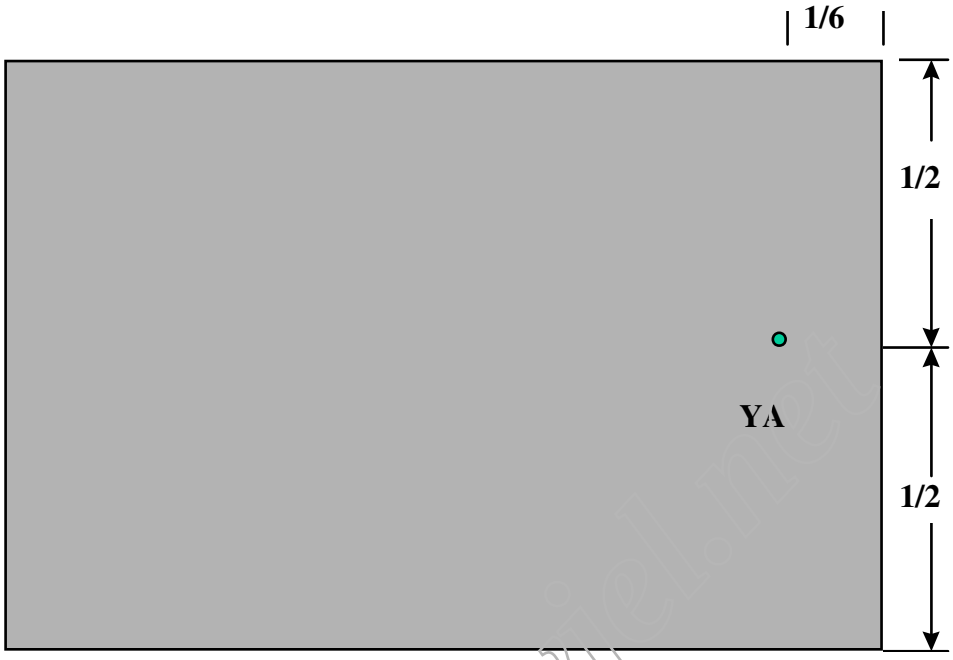
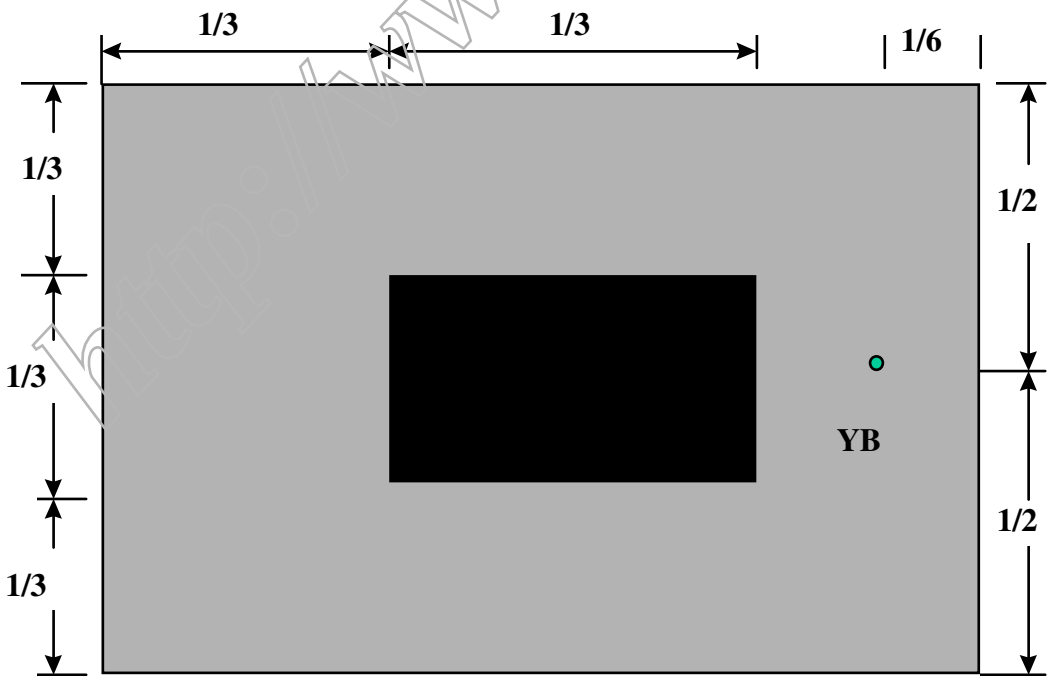


Fig 3: Cross talk Pattern
Center at Gray level 0 (Black)



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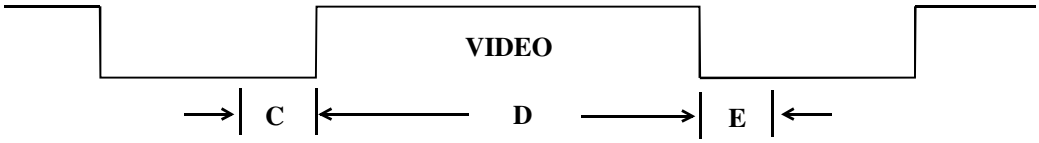
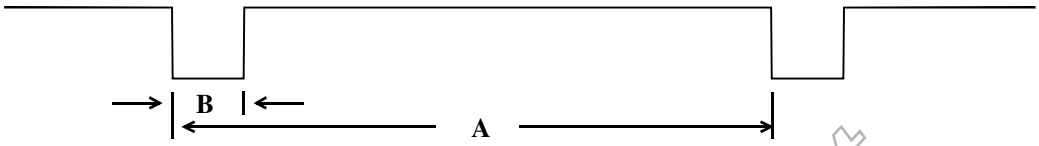
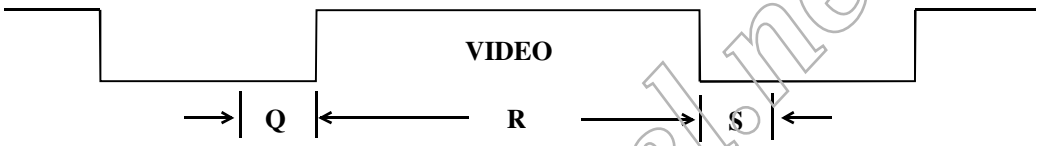
SEPARATE SYNC.

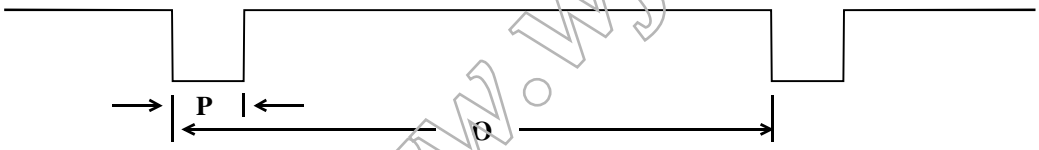


HORIZONTAL

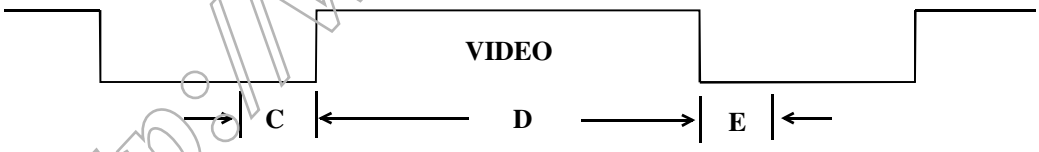




VERTICAL



COMPOSITE SYNC.



HORIZONTAL

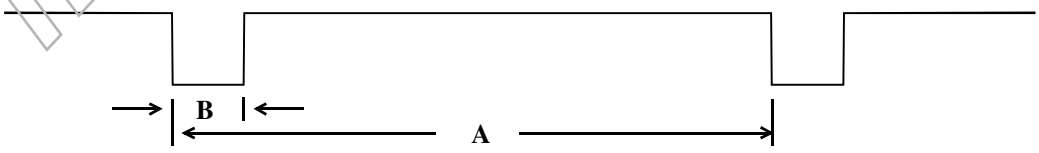


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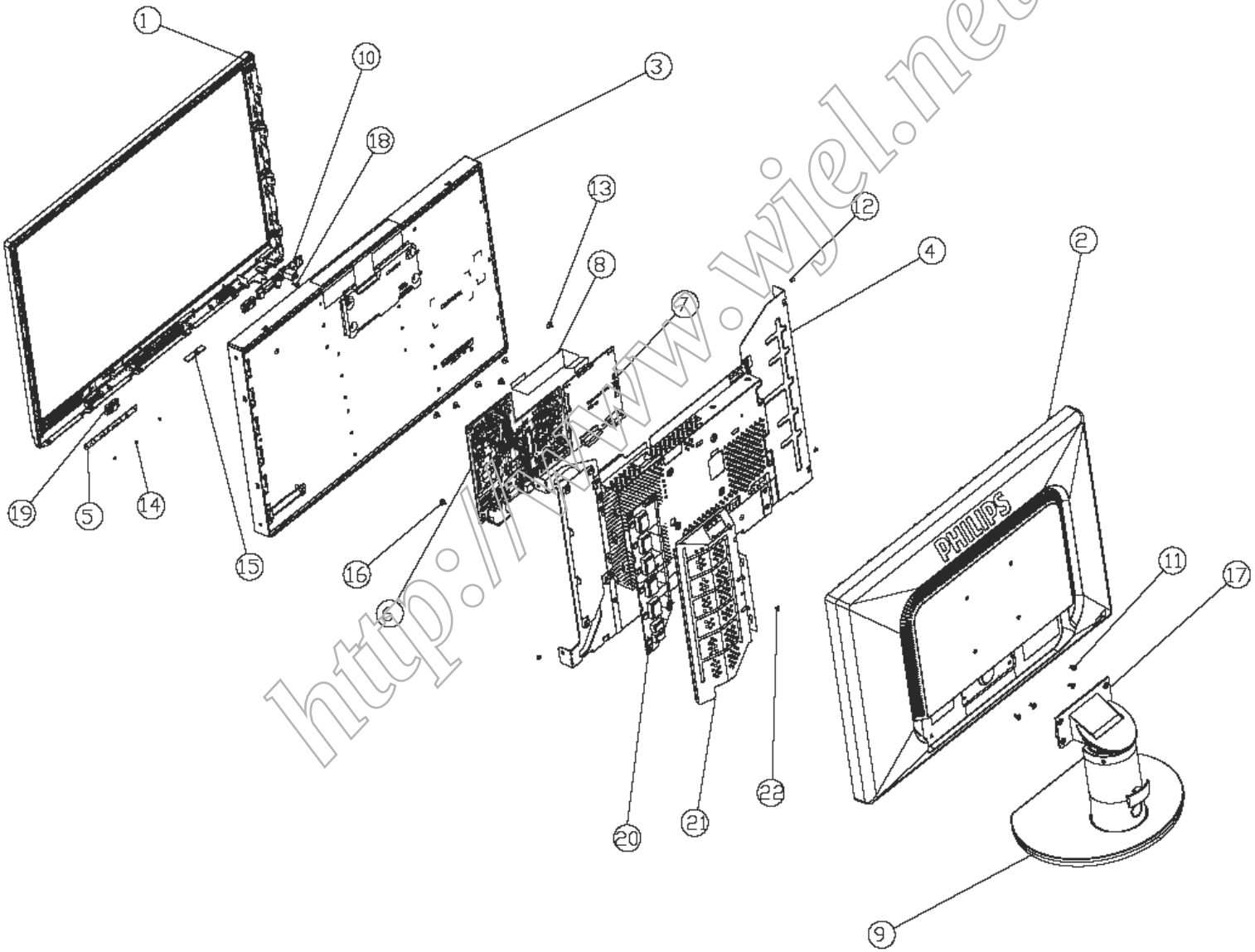
FIG-4 TIMING CHART -1

Exploded View



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Spare / Recommended Parts List

Model:240BW9

Panel+PCBA Styling		Model		240BW9CS/00	240BW9CB/00	240BW9CB/69	240BW9CB/27	240BW9CB/75	240BW9CB/93
location	Description	PCM code	Philips 12NC	SEC	SEC	SEC	SEC	SEC	SEC
7	MAIN (I/F) BOARD ASS'Y	5E.0JS01.001	996510019300	V	V	V	V	V	V
6	POWER BOARD ASS'Y	5E.0JS02.001	996510019301	V	V	V	V	V	V
5	ASSY CTRL BD+FFC CABLE	6K.0JS13.001	996510019238	V	V	V	V	V	V
15	ASSY LED BD+FFC CABLE	6K.0JS14.001	996510019239	V	V	V	V	V	V
3	LCDM LTM240CT03 P (SEC)	5F.LSDPP.001	996510019299	V	V	V	V	V	V
10	USB BD	5E.0KH15.001	996510018831	V	V	V	V	V	V
20	NVERTER BD	5D.0JS01.001	996510019315	V	V	V	V	V	V
8	FFC CABLE 30P	5K.0JS06.002	996510019313	V	V	V	V	V	V

Mechanical Styling		Model		240BW9CS/00	240BW9CB/00	240BW9CB/69	240BW9CB/27	240BW9CB/75	240BW9CB/93
location	Description	PCM code	Philips 12NC	SEC	SEC	SEC	SEC	SEC	SEC
9	BASE ASS'Y	6K.0JS11.011		V					
		6K.0JS11.001	996510019312		V	V	V	V	V
17	COLUMN ASS'Y	6K.0JS05.001	996510019306	V	V	V	V	V	V
1	FRONT BEZEL ASS'Y (Silver)	6K.0JS06.011		V					
	FRONT BEZEL ASS'Y (BLACK)	6K.0JS06.001	996510019304		V	V	V	V	
	FRONT BEZEL ASS'Y (Black)	6K.0JS06.021	996510019749						V
2	REAR COVER ASS'Y	6K.0JS07.001	996510019305	V	V	V	V	V	V
19	SPK*2	2C.40JS0.001	996510019314	V	V	V	V	V	V

Packing Styling		Model		240BW9CS/00	240BW9CB/00	240BW9CB/69	240BW9CB/27	240BW9CB/75	240BW9CB/93
location	Description	PCM code	Philips 12NC	SEC	SEC	SEC	SEC	SEC	SEC
100	CUSHION FRONT	4G.0JS01.001	996510019308	V	V	V	V	V	V
110	CUSHION REAR	4G.0JS02.001	996510019309	V	V	V	V	V	V
120	CARTON	4D.0JS01.001	996510019307	V	V	V	V	V	
		4D.0JS01.031	996510019750						V

Accessory Styling		Model		240BW9CS/00	240BW9CB/00	240BW9CB/69	240BW9CB/27	240BW9CB/75	240BW9CB/93
location	Description	PCM code	Philips 12NC	SEC	SEC	SEC	SEC	SEC	SEC
200	USER MANUAL 240BW9	4J.0JS01.001	996510019310	V	V	V	V	V	V
210	CD 240BW9	5B.0JS01.001	996510019311	V	V	V	V	V	V
30	CORD H05VV-F 10A250V EUR 1.8M	2G.00921.001	996510007306	V	V				
	CORD H05VV-F 13A 1.8MM UK	2G.03149.021	996510007304			V			
	CORD SVT125V WO/SH US 1.8M I S	2G.01111.001					V		
	CORD 3ASL/75DU-IN 250V1.8M AUS	2G.01343.001	996510007305					V	
	CORD RVV 250V 1.8M BLK CHINA	2G.04245.001	996510006066						V
25	CABLE SIGNAL (D-SUB)	5K.L2H06.501	996510006065	V	V	V	V	V	V
26	CABLE DVI-D	5K.L0S05.501	996510007963	V	V	V	V	V	V
27	CABLE AUDIO	5K.L1S11.501	996510018841	V	V	V	V	V	V

Critical components		Model		240BW9CS/00	240BW9CB/00	240BW9CB/69	240BW9CB/27	240BW9CB/75	240BW9CB/93	
Location	Description	PCM code	Philips 12NC	SEC	SEC	SEC	SEC	SEC	SEC	Remark
IC601	IC PWM CURRENT NCP1203P60G 8P	0D.01203.101	996510007138	V	V	V	V	V	V	Power controller IC
IC851	IC PWM CTRL TL1451ACN DIP 16P	0D.01451.070	996510019040	V	V	V	V	V	V	DC to DC controller IC
IC551	IC PWR AMP APA2070JI-TUL 16P	0D.02070.010	996510019302	V	V	V	V	V	V	Audio Amplifier IC
IC651	IC TRANSITION CTRL L6562N 8P	0D.06562.070	996510019212	V	V	V	V	V	V	PFC controller IC
Q651	FET MOS 2SK3502-01MRSC TO-220F	0F.03502.020	996510019213	V	V	V	V	V	V	PFC switching MOSFET
Q601	FET MOS 2SK3679-01MR 900V	0F.03679.020	996510019214	V	V	V	V	V	V	Power switching MOSFET
D701 D702	DIODE SB 20A 150V FME-220B	0F.20015.111	996510019215	V	V	V	V	V	V	Rectifier Diode
BD601	DIODE BRIDGE600V4A GSIB4A60-E3	0F.4R060.150	996510019031	V	V	V	V	V	V	Rectifier Diode
D652	DIODE REC 600V 8A YG971S6R	0F.8R060.031	996510019216	V	V	V	V	V	V	PFC boost Diode
C605	CAP 120U450VBC7.5RC740 18*45-P	0J.1272M.083	996510015659	V	V	V	V	V	V	Filter Capacitor
C661 C662	CAP MKP 0.47U 520V J RF15	1A.4743U.30E	996510019217	V	V	V	V	V	V	Filter Capacitor
R608 R609 R657 R658 R660 R661	RES MGF 1M 1/4W F AT	1D.10045.112	996510019218	V	V	V	V	V	V	Potentiometer
R650 R651	RES MGF 1.2M 1/4W F AT	1D.12045.112	996510019219	V	V	V	V	V	V	Potentiometer
R671	RES MGF 499K 1/4W F AT	1D.49935.112	996510019220	V	V	V	V	V	V	Potentiometer
TR601	THERM NTC 5 OHM D15 KC7.5 L4	1G.60061.011	996510019221	V	V	V	V	V	V	Inrush current protector
T651	XFORM PWR RM-10 390UH 2405FPW	1J.20285.001	996510019222	V	V	V	V	V	V	PFC boost Inductor
T601	XFORM PWR DS3324 540UH 2405FPW	1J.20289.001	996510019303	V	V	V	V	V	V	Power Transformer
L851 L852	CHOKE 47UH T50-52 17*10+PCB	1J.40229.041	996510019027	V	V	V	V	V	V	Dc to DC coil
L651	CHOK COIL 300UH T60-26 2405FPW	1J.40245.001	996510019224	V	V	V	V	V	V	Filter Inductor
L601	LINE FILTER 19MH ET-24	1J.42030.011	996510019042	V	V	V	V	V	V	EMI filter
VAR1	TVS 10D 470V TVR10471KSC3F7SW	2D.50009.021	996510019049	V	V	V	V	V	V	Over voltage protector
F601	FUSE4A250V CERA ST20 T/LA RF25	2F.14001.932	996510019225	V	V	V	V	V	V	Over Current protector
CN702 CN1	HEAD ML 1R8P RT D2 3S H4.8	2K.62095.108	996510019226	V	V	V	V	V	V	Not critical part
U3	IC CTRL RTD2122L LQFP 48	7A.02122.00E	996510019037	V	V	V	V	V	V	MCU IC
U6	IC CTRL RTD2549TH-LF QFP 208P	7A.02549.A0E	996510019038	V	V	V	V	V	V	SCALAR IC
U1 U2	IC EEPROM AT24C02BN-SH-T SON-8	7B.02402.C01	996510007137	V	V	V	V	V	V	DDC for D-sub or DVI
U4	IC EEPROM AT24C16BN-SH-T SON-8	7B.02416.N01	996510007136	V	V	V	V	V	V	It's EEPROM to record HDCP key, FGA data and other parameter
U5 U7	IC SDRAM EM638325TS-6G TSOP86	7B.63832.009	996510019041	V	V	V	V	V	V	For FRC
Q852	FET MOS 2SJ598-ZK-E1-AZ TO-252	8D.02598.036	996510019034	V	V	V	V	V	V	Dc to DC switching MOSFET

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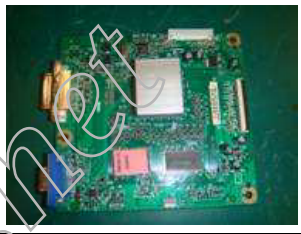
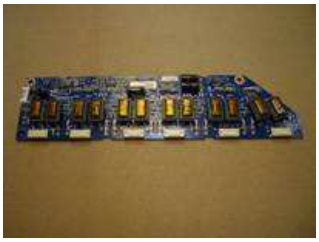
Panel & PCBA photos

ITEM	PCM	Philips 12NC	Description	
1	5F.LSDPP.001	996510019299	LCDM LTM240CT04 P (SEC)	
2	5E.0JS01.001	996510019300	MAIN (I/F) BOARD ASS'Y	
3	5E.0JS02.001	996510019301	POWER BOARD ASS'Y	
4	6K.0JS13.001	996510019238	ASSY CTRL BD+FFC CABLE	
5	6K.0JS14.001	996510019239	ASSY LED BD+FFC CABLE	
6	5E.0KH15.001	996510018831	USB BD	
7	5D.0JS01.001	996510019315	INVERTER BD	

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Repair Tips

0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential !

1. Servicing of SMDs (Surface Mounted Devices)

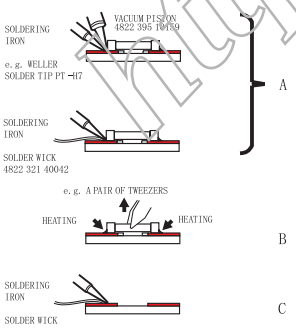
1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).

- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

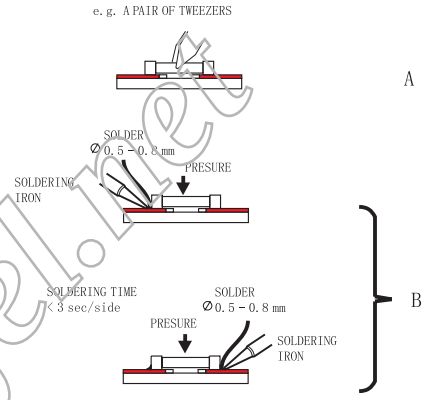
1.3 Caution on removal

- When handling the soldering.iron. use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 C).
- The chip, once removed, must never be reused.

1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig.2A).
- Next complete the soldering of the terminals of the component (see Fiq. 2B).

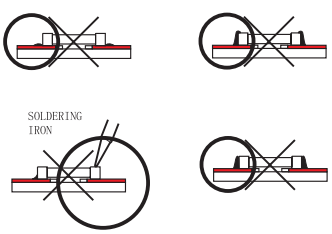
Fig. 2 MOUNTING



2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).

Fig.3 Examples



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Repair Tips

3. Lead-free product identification

You can identify lead-free product by Philips-lead-free logo on PCB.

4. Lead-free product repair instruction

4.1 Use only lead-free Solder Alloy 0622 149 00106(1.2mm SAC305) or 0622 14900108(1.0mm SAC305).
Remark: For lead free soldering material, please visit www.alphametals.com website for details. This is recommended by Philips.

4.2 Use only adequate solder tools applicable for lead-free soldering-tin. The solder tool must be able to reach at least a solder-temperature of 400 , to stabilize the adjusted temperature at the solder-tip and to exchange solder-tips for different applications.
Small Passives/Actives to be removed with thermal tweezers
Automated system for IC and BGA repair (Microscope, Camera, Beam split optics, Computer, Programmer, Heat controllers, Vacuum system, Laser pointer) Solder Hand-Tool (Adjustable in temperature height, Temperature shall be held constant,Flexible tips)

4.3 Adjust your solder tool so that a temperature around 360 -380 is reached and stabilized at the solder joint.
Heating-time of the solder-joint should not excee d ~ 4 sec. Avoid temperatures above 400 otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed.Corrosion of Tool-Spikes can be avoided when using SAC305 and a temperature of less than 400 .

4.4 Mix of lead-free solder-tin/parts with leaded soldering-tin/parts is possible but not recommended. If not to avoid clean carefully the solder-joint from old tin and re-solder with new tin.

4.5 Use only original spare-parts listed in the Service-Manuals. Standard-material(consumables) can also be purchased at external companies.

4.6 Special information for lead-free BGA-ICs: this ICs will be delivered in so-called dry-packaging to protect the IC against moisture and with lead-free logo on it. This packaging may only be opened shortly before it is used (soldered). Otherwise the body of the IC gets wet inside and during the heating time the structure of the IC will be destroyed due to high(steam-)pressure. If the packaging was opened before usage the IC has to be heated up for some hours (around 90) for drying (Take attention for ESD-protection!)

5. Rework on BGA (Ball Grid Array) ICs

General
Although (LF)BGA assembly yields are very high, there may still be a requirement for component rework. By rework, we mean the process of removing the component from the PWB and replacing it with a new component. If an (LF)BGA is removed from a PWB, the solder balls of the component are deformed drastically so the removed (LF)BGA has to be discarded.

Device Removal
As is the case with any component that, it is essential when removing an (LF)BGA, the board, tracks, solder lands, or surrounding components are not damaged. To remove an (LF)BGA, the board must be uniformly heated to a temperature close to the reflow soldering temperature. A uniform temperature reduces the chance of warping the PWB.
To do this, we recommend that the board is heated until it is certain that all the joints are molten. Then carefully pull the component off the board with a vacuum nozzle. For the appropriate temperature profiles, see the IC data sheet.

Area Preparation
When the component has been removed, the vacant IC area must be cleaned before replacing the (LF)BGA.
Removing an IC often leaves varying amounts of solder on the mounting lands. This excessive solder can be removed with either a solder sucker or solder wick. The remaining flux can be removed with a brush and cleaning agent. After the board is properly cleaned and inspected, apply flux on the solder lands and on the connection balls of the(LF)BGA
Note: Do not apply solder paste, as this has shown to result in problems during re-soldering.

Device Replacement
The last step in the repair process is to solder the new component on the board. Ideally, the (LF)BGA should be aligned under a microscope or magnifying glass. If this is not possible, try to align the (LF)BGA with any board markers.
To reflow the solder, apply a temperature profile according to the IC data sheet. So as not to damage neighbouring components, it may be necessary to reduce some temperatures and times.

More Information
For more information on how to handle BGA devices, visit this URL: http://wwwatyourservice.ce.philips.com (needs subscription). After login, select Magazine , then go to Workshop Information . Here you will find Information on how .to deal with BGA-ICs.

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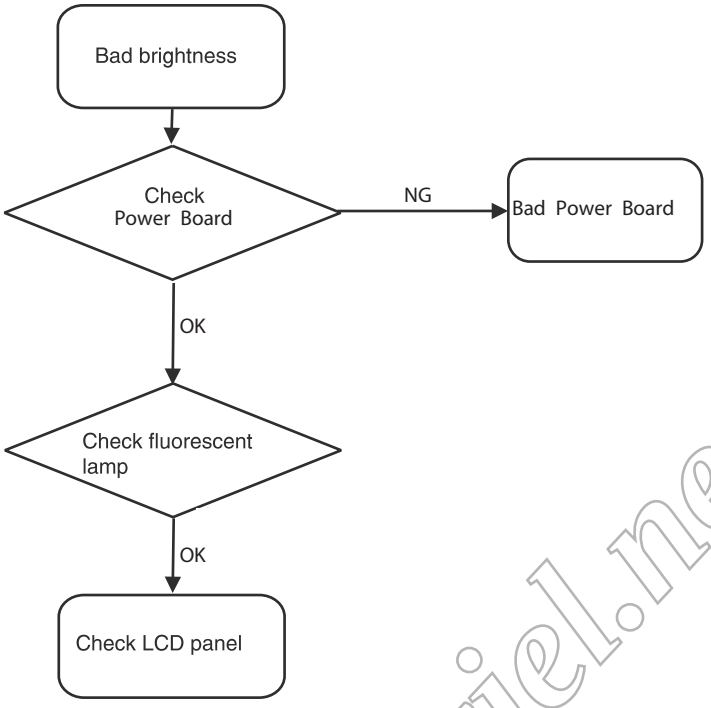
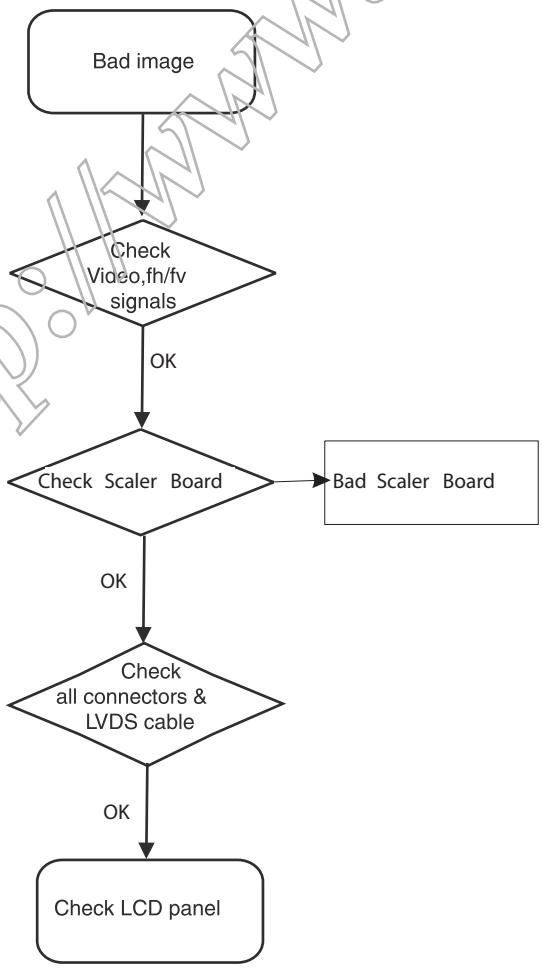
Repair Flow Chart





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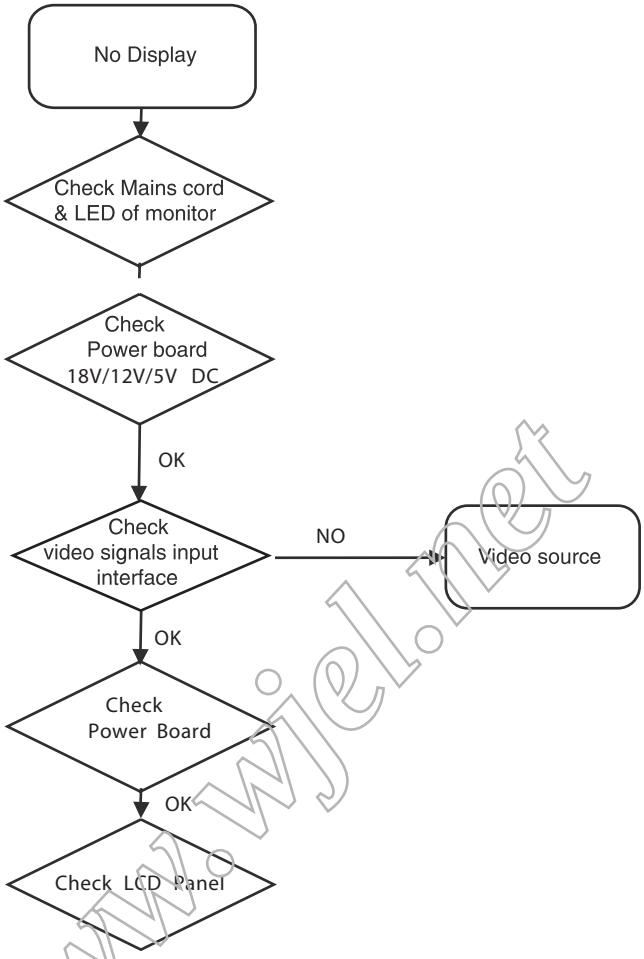
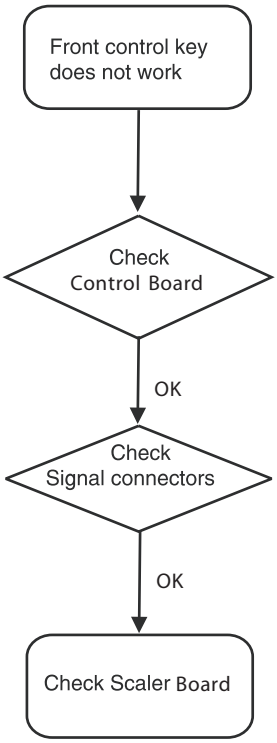
Repair Flow Chart





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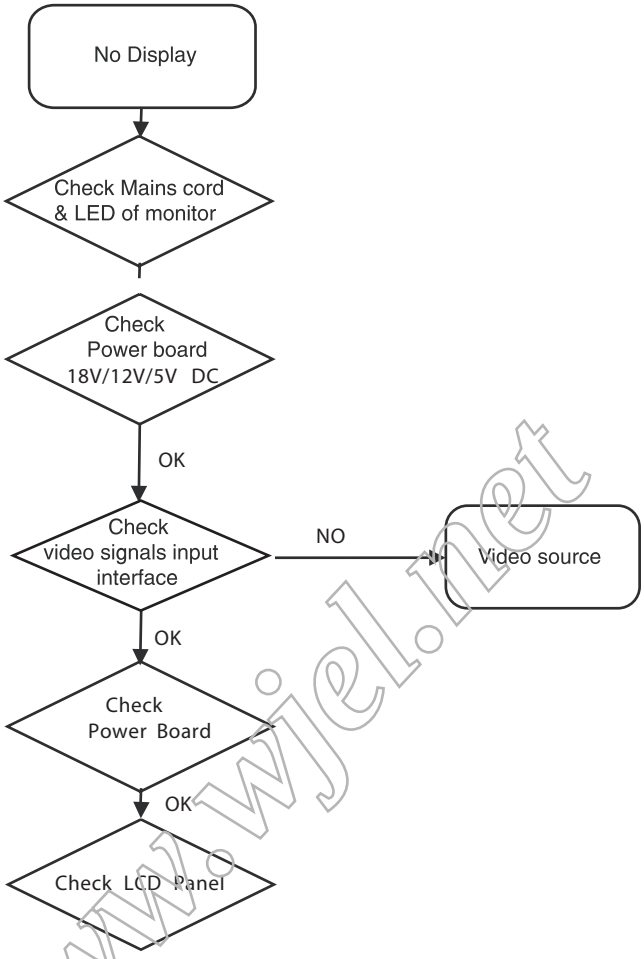
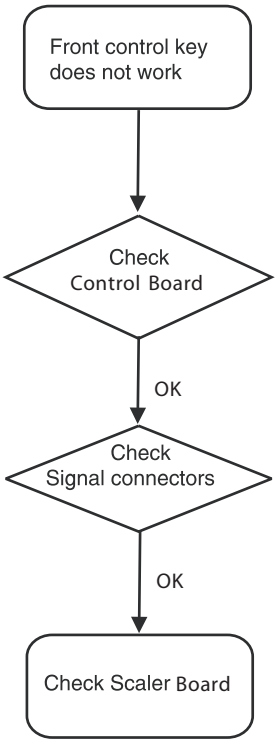
Repair Flow Chart





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Safety Test Requirements

All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both Hipot and Ground Continuity testing.

HI-POT TEST INSTRUCTION

1.Application requirements

1.1 All mains operated products must pass the Hi-Pot test as described in this instruction.

1.2 This test must be performed again after the covers have been refitted following the repair , inspection or modification of the product.

2. Test method

2.1 Connecting conditions

2.1.1 The test specified must be applied between the parallel-blade plug of the mainscord and all accessible metal parts of the product.

2.1.2 Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.

2.1.3 The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	Hi-Pot Test for products where the mains input is 220V AC	Hi-Pot Test for products where the mains input is 110V AC	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A, AC Test time: 3 seconds Resistance required: <=0.09+Rohm, R is the resistance of the mains cord.
Test time	3 seconds	1 seconds	
Trip current (Tester)	Set at 100uA for Max limit; Set at 0.1uA for Min limit.	5mA	
Ramp time (Tester)	Set at 2 seconds		

2.2.1 The minimum test duration for Quality Control Inspector must be 1 minute.

2.2.2 The test voltage must be maintained within the specified voltage + 5%.

2.2.3 There must be no breakdown during the test.

2.2.4 The grounding blade or pin of mains plug must be conducted with accessible metal parts.

3. Equipments and Connection

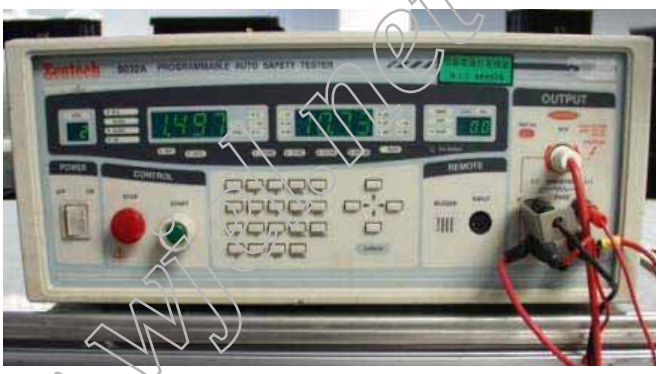
3.1. Equipments

For example :

- Zentech 9032 PROGRAMMABLE AUT O SAFETY TESTER

3.2. Connection

* Turn on the power switch of monitor before Hipot and Ground Continuity testing.

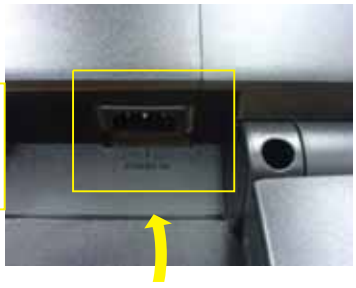


(Zentech 9032 tester)

Clip

Connect the clip to the monitor.

Connect the power cord to the monitor.



Power outlet

(Rear view of monitor)

4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.

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